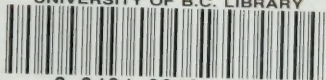


UNIVERSITY OF B.C. LIBRARY

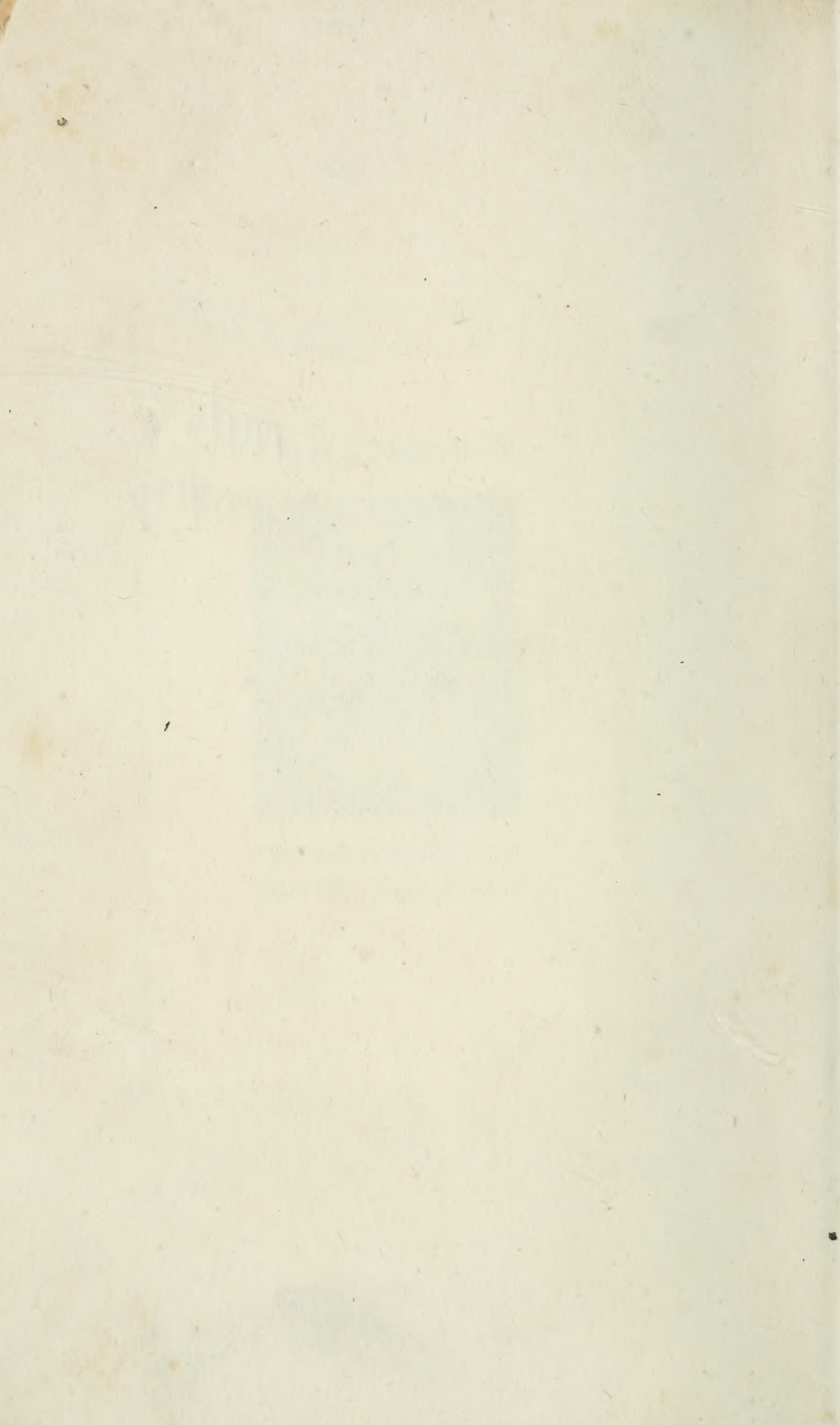



3 9424 00125 9628

STORAGE ITEM
PROCESSING-ONE

Lp1-F18D

U.B.C. LIBRARY





Digitized by the Internet Archive
in 2010 with funding from
University of British Columbia Library



GENERAL VIEW
OF THE
AGRICULTURE
IN THE
COUNTY OF PERTH:

WITH
OBSERVATIONS ON THE
MEANS OF ITS IMPROVEMENT.

BY JAMES ROBERTSON, D. D.
MINISTER AT CALLANDER IN THE COUNTY OF PERTH.

DRAWN UP FOR THE CONSIDERATION OF
THE BOARD OF AGRICULTURE AND
INTERNAL IMPROVEMENT.

*Quare agite, o proprios, generatim discite cultus,
Agricola!—Nou Segnes jaceant terræ. VIRG. GEORG.*

P E R T H:

PRINTED BY ORDER OF THE BOARD OF AGRICULTURE,
FOR JAMES MORISON, AND SOLD BY WILL. MORISON, BOOKSELLER,
M,DCC,XCIX.

PREFACE.

THERE is a propriety in acquainting the Reader with some circumstances relative to this publication.

1. The subsequent account of the Agriculture of Perthshire is drawn up partly from Mr Marshall's report of the central Highlands, Mr Donaldson's of the Carse of Gowrie, and a report of the southern districts of the county, by the Author; and partly from a new Survey of the provinces, which had not formerly been explored, together with the Remarks transmitted to the Board of Agriculture, in consequence of the circulation of these Reports.

Although I did not consider myself as bound to adhere invariably to the observations, which had been made by these two gentlemen; yet I have made use of their papers, so far as they suited my purpose, and seldom departed from the detail of facts or opinions they had given; except where their information seemed to be defective, where the progressive improvement of the county, the irresistible testimony of the most intelligent persons in the several districts, or my own inspection, justified that departure. In general I have given their most important matter

in their own words. It is impossible for different men to see with the same eyes. There is frequently a shade of difference betwixt our opinions even upon the most common and obvious subjects: far more so, upon Agriculture, which must for a long time be a field of experiment, before it can be brought to rest upon the basis of fixt principles, established on facts and ascertained by universal consent. Not only does the diversity of materials and situations occasion a difference of opinions, in rural economy, but one man may omit as frivolous, what another deems worthy of the public attention; and one may account a subject to be important, which another has passed over slightly or entirely overlooked.

2. It has been recommended to me to give directions upon the different points that occurred, because a bare detail of facts could not be so interesting or useful, when thrown together in a disjointed form, as when they are accompanied with suitable illustrations; and the practice of the different provinces in rural affairs would be better understood and perhaps more or less adopted, when that practice was recommended or disapproved of, upon rational principles. This part of my task was undertaken with reluctance; and it is with much anxiety and deference I now lay my own opinion of different modes of culture, before the public; because the ground, on which I stand, is hazardous, and the field before me has hitherto, in its full extent, been
by

by me untrodden, which, although it may have amused my vacant hours, in the intervals of more important business, yet being out of the line of professional study, has seldom occupied the whole force of the mind in the serious mood of intense application.

The facts I relate, affect me with less anxiety than the opinions, which I am urged to give; because I have endeavoured to draw from the purest sources of information; and where there was danger of mistake, to collect materials from those ranks of society, whose intelligence and situation in life gave them the most ample claim to undoubted credit; and I have prefixed the name of each individual, in my notes, to the facts, which they did respectively communicate.

3. Wherever the animadversions seemed to be of any moment, which had been made on the margins of the three original Reports, I have taken them down in notes; but where they appeared to be otherways, I confess that I have passed them over. Some of them related to provincial terms, which are now explained. Others were occasioned by the difference of weights and measures, used in North and South Britain; of which I have annexed some tables. Not a few referred solely to typographical errors of the press in one of the former reports; and a few of them consisted of several pages, having the appearance of dissertations. I regret exceedingly

that the remarks of one English gentleman, whose goodness of heart entitled his opinions to all my respect, were so long, that to have taken them down fully, would have swelled this Volume beyond all reasonable bounds; and I did not think myself at liberty to abridge them.

4. Unawed by fear and unfelicitous of adulation, I have written without bias or prejudice, neither applauding nor censuring individuals, nor any class of the community, contrary to the dictates of integrity and truth, as far as I could discern them. The prosperity of my country was always the object nearest my heart; and if this survey shall in any degree promote the public good, I am satisfied. The pains, however, which I have bestowed to accomplish that end, it may perhaps be prudent to conceal, until the fate of this publication be known.

In this enlightened age, and on a subject of a complicated nature, in which new theories are starting up every day, new experiments continually made, and the most experienced improvers holding different opinions on a variety of subjects, it is vain to expect that the judgment of any individual can coincide with the sentiments of all men.

I have endeavoured to compress my subject; yet it gives me concern that this report may, perhaps to some, appear too long. The only apology I can offer is, that the County of Perth, in my opinion at least, is the most important in Scotland, in
respect

respect of the extent of territory and the knowledge of agriculture, taken collectively; and that in these circumstances, I was under the necessity of following the current of my subject, relying on the candor of the public, at whose bar I stand, whose indulgence I crave, and to whose judgment I submit with a respectful silence.

A TABLE

A TABLE OF WEIGHTS AND MEASURES.

LIQUID MEASURE.

1 Scotch pint	=	103.4	cubic inches.
1 English beer pint	=	25.35	do.
1 English wine pint	=	28.875	do.

DRY MEASURE.

1 Winchester bushel	=	2150	cubic inches.
1 Scotch firlof or bushel for rye, peafe, beans, rye grafs, and falt	}	2199	do.
1 Linlithgow firlof for bafley, oats, malt, fruit, and potatoes			
1 Perth common firlof for barley	=	3313.5	do.
1 Stirling barley firlof is about $7\frac{1}{2}$ per cent. or $\frac{1}{13}$ larger than the Linlithgow firlof. It is ufed in Monteath, a diftrict of Perthfhire.			
4 lippies or forpits	=	{ 1 peck or $\frac{1}{4}$ of a bushel or firlof refpectively.	
4 pecks	=	1 bushel or firlof of the feveral meafures.	
4 firlots or bushels	=	1 boll.	
8 bushels	=	1 quarter Englifh, or 2 bolls wheat meafure.	
16 bolls	=	1 chaldron, or 1 chalder Scotch.	
4 quarters	=	1 chaldron Englifh.	

WEIGHTS.

16 ounces averdupois	=	{ 1 lb. do. commonly called Englifh weight.
17 $\frac{1}{2}$ ounces	=	
22 ounces do. in fome places	}	1 lb. Dutch or Amfterdam weight.
24 ounces do. in other places		
16 lb. refpectively	=	1 ftone.
112 lb.	=	1 hundred weight.
20 hundred weight	=	1 ton.

LAND MEASURE.

An Englifh acre	=	4840	ftquare yards.
A Scotch acre commonly	=	6084	do.

N. B. If the differences of inches were narrowly attended to in making the Scotch chain, a Scotch acre would be equal to 6150.7 ftquare yards.

INTRODUCTION.

OF all the branches of natural philosophy, we know, that is the most important, which investigates the causes of the fertility of the earth, in producing sustenance for the human kind. Others may be more splendid; but this is the most useful. The knowledge of the causes and cure of diseases, incident to man, may claim the second place. Mechanics promote our convenience and safety in various respects; navigation, as founded on astronomy, facilitates our intercourse with distant nations. These and other branches of this wonderful system of the providence of the Creator, minister to our comfort, merit our attention and claim our gratitude; but agriculture alone feeds the lamp of life, and enables us to be capable of that gratitude, which is due to the Author of our being and of our well-being. She alone traces the footsteps of nature, and seconds her efforts, in providing us with food to eat and raiment to put on. She is the parent of society, and the nursing mother, to whose breasts we all cling, and in whose lap we are reared. She has made the desert a fruitful field; she has planted grain where forests grew; she clothes our land with grass for cattle and with the herb for the use of man. She fills our houses with plenty, our hearts with gladness, and puts into our hands the staff of life.

Agriculture has therefore been encouraged by the wisest and best men, in all ages, and has been deservedly held in
the

the highest estimation by the greatest and most polished nations, that ever appeared in the world : and the most elegant writers have transmitted to posterity the successive improvements which this art has received.

The patriarchs were shepherds and husbandmen. The Chaldeans, the Persians, the Phœnicians, the Egyptians founded their prosperity on the cultivation of the ground ; and Xenophon assures us from his own observation, that wherever agriculture occupies the attention of mankind, the arts thrive ; wherever it is neglected, the arts are not to be found.

The fabulous ages, in which men are supposed to have lived on acorns and other spontaneous productions of the earth, had existence only in the imaginations of poets. A few wandering savages may have since been discovered occasionally in favoured climes, near the equator, who drag out a forlorn existence without tillage ; but the comfort of man arises from society ; society necessarily implies the exercise of ingenious arts ; and every artist ultimately depends for his subsistence on the productions of the earth. By the sweat of his brow man was destined to earn his bread. Not only was the first man doomed to till the ground ; but his posterity must follow his example : and men in every rank of life from the highest to the lowest, and in every age, from the beginning of time, are indebted to the bounty and supported by the fruits of agriculture.

Wherever mankind were civilized, we find by the most authentic records, that the cultivation of the soil kept pace with the civilization of the human race. The one was always in proportion to the other. They have in every country flourished and fallen together ; and they have maintained this uniform progress down to our own times.

and

Ancient Egypt was not only a nursery of the human race, but a granary to other nations, in the article of food. Both the kings and people of Judea paid uncommon attention to the cultivation of their country, and thereby increased its population to a degree almost incredible. Greece, in her best times, produced both examples and writers on farming. Rome, in the zenith of her glory, held in the highest esteem the first and best of all the arts. Cato the censor, and Varro and Columella treated of rural economy. They embellished the poetical rules of Hesiod, the dry maxims of Aristotle and the other Greek farmers, with all the charms of erudition, adding many observations till then unknown. Virgil, with all the harmony of heroic verse, the richest ornaments of language, and the highest pomp of poetic imagery, has detailed the knowledge in agriculture known or practised in his time. It were easy to quote many other instances both from ancient and modern times to support the assertion, That the culture of the soil, and the culture of the human mind have gone on together, in every country on the face of the globe; but without entering upon a tiresome detail on this point, I leave it to the reader's own acquaintance with history, not afraid that he will find one instance, in which the people were barbarous and the ground cultivated, or the ground neglected and the people civilized.

Upon the testimony of Cæsar and Pliny we are led to believe that the ground was cultivated, and that the use of manure for raising crops was known in Britain 100 years before the Roman invasion*. And although the unsettled state of public affairs both in South and North Britain, for a series of years after the Romans left the country, prevented the progress of husbandry, yet we have reason to suppose that exer-

b

tions

* Cæs. Lib. v. c. 12.

tions were made, to increase the fertility of the soil, which few people in such untoward circumstances would have attempted.

Our fathers had the means of subsistence to provide for themselves and their families, under all the discouragements of the precarious tenure, incident to a state of continual warfare, during the feudal system; and yet we find they bestowed an attention upon the cultivation of their country, for which we are not disposed at all times to give them due credit. Extensive fields were cleared of wood; marshes were drained; wild beasts were extirpated or subdued, and loose stones were collected off the land, in such heaps, as astonish their posterity.

It was not, however, until the government of this country was settled at the revolution, till possession was more permanent, till property was better secured by the law, than by the sword, till the liberty of the people was defined, understood and enjoyed, that the Genius of agriculture smiled upon Britain. But notwithstanding these national advantages; notwithstanding the enterprize of Tull and of others, who struck out a new path and attempted to rouse the drooping industry of their countrymen, near half a century elapsed, before the generality of landlords ever dreamed of allowing their tenants to enjoy the fruit of their labours, by granting leases, and before the tenants themselves aspired to that respectability in society, which the laws of their country held up to their view.—Something was still wanting, at least in this part of the united kingdom, to raise the people in the political scale, to convince them that their property was their own, and that their persons were free. The great and the good Pelham did them this service. He abolished heritable jurisdictions. The people felt their own importance. They
fat

fat securely under the shield of the law. They claimed and enjoyed the fruits of their own industry ; and the more they relished the comforts of life, the more they were disposed to be industrious. The most generous of the proprietors granted leases to their tenants, ensuring the undisturbed possession of their farms for a term of years ; a few set examples of superior cultivation before them. By milder treatment their confidence was gained, their attachment was founded on esteem, not on fear ; and a spirit of industry was diffused, which was formerly unknown in Scotland.—Every person who is arrived at manhood, and was at pains to look around him 20 or 30 years ago, must bear testimony to the rapid progress, in every species of cultivation, suited to the soil and climate, which has been made by gentlemen and farmers within that period. How patriotic the design, and how noble the purpose, to promote it more and more !

PRELIMINARY OBSERVATIONS.

1. **BESIDES** the spirit of the times and the influx of wealth into the country of late years, the laudable example of many of the country gentlemen has contributed much to the improvement of this and every other county in the kingdom. In place of living in solitary castles, built in places either inaccessible by nature, or surrounded with walls and ditches; their mansions are elegant, and their parks are laid out with taste. They not only embellish their residence, but they inclose, they plant, they drain, they dress their estates; and teach their tenants the truest lesson of industry, in shewing them how to increase their wealth and their comfort, by a proper culture of the land and a better management of their stock.

That the face of the country is greatly changed and this remark fully verified, will not only appear, it is hoped, from the following Report, but must be evident to any person, who attends to the spirited operations daily carried on in most parts of the county. The communications of proprietors to me in the course of the survey in 1793, and in 1795, have a just claim to my warmest acknowledgments. In general I have been well supported by many persons, who are no less enlarged in their views and high in their rank, than opulent in their fortunes: and if the following Report has any merit, it is owing to them: but without having asked their permission, it might be deemed indelicate to mention their names.

2. Notwithstanding the influence of the proprietors, it must

must be evident to any person acquainted with human nature, that there is a reluctance among the lower ranks of men, to change old customs or to relinquish habits, which have acquired the sanction of time, and are established by the authority of ages. Although this principle, which operates universally, has, in most cases, the happiest effects; yet with regard to the cultivation of the ground, its consequences are most baneful. In this respect it cools the ardour and enervates the vigour of the human mind, enslaved in the prejudices and errors of antiquity. The husbandman's hands are fettered in the shackles of ancient customs: He treads in the footsteps of his fathers and spurns at every new improvement, as an innovation. Nothing can be more absurd, nothing more hostile to every species of improvement in this art, than an obstinate adherence to old modes of cultivation. This obstinacy is however wearing off, in the district under review; and it is hoped, from the modes of husbandry, which are already adopted in different places, and from the exertions of the Board of Agriculture, that a spirit of improvement will be diffused, which shall surmount obstinacy where it remains, and in spite of old habits, make the people open their eyes to discern their true interest. Mankind must be led; they cannot be driven. Let the enlightened admire the principle, which directs the people to be steady, while they deplore its effects in the particular instance of husbandry. Let them also combat the influence of habit by the principle of self-love. Let them *convince* men of this class, that by a certain mode of farming they shall be better fed, and better clothed, and become richer; and few will refuse to adopt it. In vain will you threaten; in vain will you prosecute and fine; in vain will you plead the

statutes and the articles of leases. Instead of all the artillery of law and the parade of power, you need only to gain the people's confidence, to convince them that you have their good at heart, and to teach them by your own example, how to promote their interest. This conduct will gradually thaw down the obduracy of the most confirmed habits, and diffuse the genial warmth of patriotism through hearts which seemed to be cold and callous.

3. Independent of climate, and the quality of soil, it is remarkable that the knowledge of agriculture, in this district, is, with very few exceptions, progressive from east to west; and it seems to be generally in this situation, over all the kingdom. The land is more fertile indeed on the east coast than on the west, in this part of the world, as well as in most others. But every soil is capable of that improvement, which is adapted to its nature. Why is the former, in most cases, improved; the latter in very few instances? The appointment of Providence makes many things progressive; and the progress is frequently from east to west. All the arts and sciences and the inventions of mankind, the civilization of the human race and the progress of society, the apparent course of the celestial bodies, the light of heaven, the introduction of many new plants ministering to the food and convenience of man, the culture of the soil, and the improvement of the world, have, from the beginning of time, been moving west-ward.

4. If the numbers of people, industriously employed, constitute the strength of a nation, the more the population can be increased, the more powerful will that nation become; but an increase of inhabitants can only be supported by a proportionable increase of the means of subsistence. The cultivation of the soil, is, therefore, the first care of all wise states.

How

How could Egypt support such a crowded population, and spare eighty thousand bushels* of corn *daily*, for the maintenance of the inhabitants of Constantinople, in the reign of Constantine the Great? How could Sicily be the granary of Rome, besides maintaining such a number of extensive cities and such vast fleets and armies, in Hiero the II'd's time? How could the land of Palestine, a small spot, furnish subsistence to such numbers of people, as have been thought incredible by persons viewing the present wretched state of that country? How could China become so populous as it is at this day and be able to support men, in number, as the sand on the sea shore? One answer suffices for the whole. These and many other nations raised themselves to a pitch of population, of wealth and of power, which astonishes shallow thinkers, who consider not the cause. The internal strength of any nation is in no case to be estimated by the extent of territory, but by the number of its citizens and the utility of their labour: and an increase in the numbers of people can, on the other hand, be in no case supported steadily, for a length of time, by any resources whatever but by their home productions, raised and augmented by a superior improvement of the soil. Had I the powers of persuasion equal to the conviction I have of the importance of this maxim, I would proclaim it to my country from the point of Shetland to the Lands end of England, until it were heard and understood and felt, by every man that eateth bread†. He that makes two ears of corn to grow where only one grew before, does more good to mankind, than the whole race of politicians together.

Manufactures,

* The Roman bushel was one foot square and four deep.

† Every one that reads and understands this, will necessarily feel the highest sentiments of respect for the very excellent remark. *Name unknown.*

Manufactures and other causes may increase the population, beyond what the produce of a country can support. In that case, recourse must be had, either to the importation of corn, or the people must emigrate: there is no other alternative. When grain and other articles of life must be imported into any country, the subsistence of the people becomes very critical; and the more so, in proportion to the quantity required, the distance of the market, and the constancy of the demand. Their supplies depend greatly on the surplus and good will of the countries, from which their subsistence comes; their supplies depend also, on their ability to purchase, and on the obstructions they may meet with from other nations, in going in quest of food: in short, the country, which cannot support its inhabitants, must keep on good terms with all its neighbours, whatever injuries and whatever insults it may receive, and can never be said to be *truly* independent. If the situation be insular, like Britain, the moment it loses its superiority at sea, every person within may be starved, who cannot be supported by the natural produce of the island. Many examples might be given to illustrate this reasoning; but it seems to be so evident, 'as to require no illustration.

The island of Great Britain is becoming more and more a manufacturing country every day. This circumstance will throw the people into towns and villages, and necessarily increase the general population; and yet many, by mistaking the stage of society, to which we are arrived, reason upon the population of the present times, not from facts, but from principles, or at least from facts unfairly and partially stated; and when the premises are false, the conclusion must be erroneous.

If the towns and villages of this country have doubled
their

their population within half a century (and some of them have increased tenfold), granting that the agricultural population may have decreased one third, what conclusion can be fairly drawn from thence, but that the general population is considerably more than it was. The more that manufactures advance, the more will this local change in the residence of the people appear.

It becomes therefore an important question with every lover of his country, How is this increased population to be maintained? It is not enough to answer, Purchase food from other nations, because a wealthy country can never be in want. The true answer is, Raise more food in your own country; apply your wealth to cultivate your own soil, that it may produce the greatest quantity of subsistence for man.

The establishment of a Board of Agriculture at this juncture, under the sanction of Parliament, prognosticates much good to this country; and it is a happy presage of its future success, that no difficulties seem to deter, and no application seems to be too arduous: and although its success may be slow at first, from a complication of various causes; yet considering the great wealth which, in less than half a century, has flowed into this country, the growing spirit, which the people have for improvement, and above all, the attention which many of the country gentlemen have bestowed of late, upon embellishing their mansions and meliorating their estates, there is no doubt that the operations of this Board, will, in a short time, excite an eagerness to adopt the best modes of culture, and that the rules given through the medium of their publications, will enlighten, teach and enrich their country.

5. The proprietors of soil may be considered as possessed of a dead stock. Every dead stock requires another to put

it in motion and make it productive. A stock, which in its rude state can produce very little of its ultimate value, may, by the application of more labour (which always requires stock), be brought to such perfection, as to produce the full amount of its intrinsic value; and can then only be said to arrive at its real worth or price. How different in value is a pound of flax from a pound of lace, or a fleece of wool from its weight in cloth? Equally different is a field or an estate uncultivated, from the value, to which it may be brought by cultivation. But there is this difference, and it is an important one, that the lace and cloth may remain unfold, and in that case will produce no subsistence to the possessors; whereas an improved field produces subsistence, independent of all the markets upon earth, and is unaffected by the caprice or enmity of surrounding nations.

6. Agriculture, like other arts, is founded upon experiment, and is learned by example, joined to practice. Theories may be of use in the sciences. In them you may proceed, by cautious steps, from the cause to the effect. Systems founded upon hypothesis alone, unsupported by experiment, are no better than a house built upon the sand. They are the effect of genius; and genius always hastens to its object. The history of the sciences demonstrates how short lived are all theories, which do not rest on the basis of a proper induction of experiments. In all the arts, and in agriculture particularly, the foundation must be laid on a faithful collection of successful trials. The steps of nature must be traced with diligence, marked with care, and recorded with integrity, before any opinion can be formed of her plan in promoting the vegetation of plants. All reasoning and all conclusions drawn from the operations of nature, especially on this subject, ought to rest ultimately on facts.

The

The farmer by following these, is led forward on safe ground, making similar trials with confidence : and if his soil be of the same nature, his climate of the same temperature, and his means of improvement equally powerful, his endeavours are generally crowned with success. While the speculative farmer, who follows the plausible system of a theorist, builds on the baseless fabric of a vision, and is ruined by imaginary schemes ; the practical farmer studies with care the example of others, matures and establishes their practice by his own experience, and enjoys the well-earned reward of his industry. The former builds on first principles alone, some imaginary scheme of vegetation : the latter admits no principles, unsupported by fact, and unconfirmed by experience.

6. The land, to which the following survey refers, seems to divide that part of Scotland on the south, which is generally adapted to the raising of grain, from that on the north, which, with few exceptions, is more fitted for pasture.

It is also singular, that the county under review divides those parts of the kingdom on the north, where firs abounded in former times, which are still found in the mosses, from those in the south, which carried oaks and a variety of other wood, but no firs, so far as I have ever heard. Nature herself, which never errs, appears to have clad our bleak mountains with a mantle, which is for ever green ; while she had planted trees, which shed their leaves, where ornament and shelter were less necessary, lest perhaps the verdure of the ground would be too much intercepted from the eye of man.

In this county is the boundary between those parts of Britain, where coal has been discovered, and these, where coal has not hitherto been found ; that useful fossil, which is so necessary for the comfort of the southern districts, being less

requisite in the north, where extensive forests of the pine, the best of all fuel, formerly grew, and still grow spontaneously.

Here is also the division betwixt the granite and the free stone; there being no free stone north of us, and the granite less frequent than the free stone on the south. Our hewing-stone quarries gradually harden, as you approach the Grampians.

Slates, that beautiful covering for houses, are found in few parts of Britain, south of this county.

Another distinguishing feature of this county is, that it contains more oak-woods, than are to be found in all the other counties of North Britain.

GENERAL

GENERAL VIEW
OF THE
AGRICULTURE
IN THE
COUNTY OF PERTH.

CHAP. I.

GEOGRAPHICAL STATE AND CIRCUMSTANCES.

SECT. I. *Situation and Extent.*

PERTH-SHIRE, which is comprehended in this Survey, is one of the most extensive counties in Scotland. It lies between $56^{\circ} 4''$ and $56^{\circ} 57''$ north latitude, extending a whole degree on the meridian, excepting only 7 minutes; and between $3^{\circ} 4''$ and $4^{\circ} 50''$ west from the meridian of Greenwich, being only about 6 minutes less than two degrees of longitude on the equator.

From east to west, betwixt Invergowrie and the top of Benloi, it extends 77 miles in a straight line, and 68 from south to north, betwixt the Frith of Forth at Culrofs, and the boundary of the east forest of Athol at the source of the Tilt. The square miles are 5236. But the sides not being straight lines, it will be nearer the truth, to estimate the square miles in round numbers, at 5,000, which amount to 3,200,000 acres of Scots measure, or 4,068,640 English acres.

On

On the east, Perthshire is bounded by the county of Angus; on the south east, by the Frith of Tay and by the counties of Fife and Kinross; on the south, by the river Forth and the counties of Clackmannan and Stirling; on the south west, by the county of Dunbarton; on the west, by the county of Argyle; on the north west, by the county of Inverness; on the north and north east, by a continuation of Invernessshire, and the county of Aberdeen.

SECT. II. *Divisions.*

THE ancient divisions of this county differ widely from those adopted in modern times. During the existence of heritable jurisdictions in the hands of the great vassals of the crown, this county was divided into Stewartries; and some of the counties of Scotland are still known under that name. The stewartry of Monteath comprehended all those parts of the county, which are south of the Ochills and south of that ridge of the Grampians, which separates the parishes of Cullander and Comrie from each other; or in other words, the lands which lie on the various streams that discharge themselves into the Forth, except Balquhiddy, which belonged to the following division.

The stewartry of Strathearn extended over all the country known by that name, including the various districts, whose waters are discharged into the Earn.

Methven had the regality of its own estate. The duke of Athol had the same authority in Athol as a separate regality; and was high sheriff of the district around Perth, including Stormont and Carse of Gowrie. The earl of Breadalbane possessed the bailliary of his own country, with all its dependencies.

Since the Jurisdiction Act took place in 1748, the sheriff
depute

depute of Perth, who is always one of the faculty of advocates, exercises the civil jurisdiction of the county, with a salary from the crown. He appoints two substitutes; one at Perth and another at Dunblane. The substitutes are now paid by the crown; not many years ago they were paid by the depute. There was formerly a substitute also at Killin.

By an act of Parliament past in 1795, extending the jurisdiction of his Majesty's justices of the peace, in determining causes for the recovery of small debts, the county of Perth is divided into nine districts, viz. Perth, Dunkeld, Weem, Dunblane, Auchterarder, Crieff, Culrofs, Inchtute, Coupar; and a certain number of parishes, contiguous to these towns, is subjected to the jurisdiction of the justices within each district.

These divisions of the county are merely arbitrary; the most natural division is into Highland and Lowland. Eighteen parishes, which are situated along the face or within the vallies of the Grampians, constitute the Highland division. Fifty nine are included in the Lowland division. Some of the Ochills and Seedlaws indeed, as observed in the topographical description * of the county, are considerably placed above the level of the sea and might be considered as Highland; yet as no church is situated in the bosom of these hills, except that of Glendevon alone, they ought to be considered as Lowland parishes, because the language of the inhabitants, their dress, their manners, their enterprize, and their habits of life, are different from those people, who inhabit the vallies of the Grampians.

There are few villages of any note, within the hilly part of this county. The people hitherto lived more upon the fruits of pasturage and of tillage, than by commerce or manufactures.

* See the Appendix, N^o 1.

nufactures. The latter is however getting in amongst them; and the people have such enterprize, that they can turn their attention, with success, to any pursuit. There are many inviting situations for villages in the Highlands; and it is the interest of the people and of the proprietors, and, I may add, of the community at large, to attend to this circumstance.

At the opening of the different vallies, where the rivers descend from the hilly to the low country, villages are established and daily increasing, whose inhabitants trade with those in the country beyond them. Gartmore, Kilmahog, Callander, Muthil, Comrie, Crieff, Foulis, Dunkeld, Blairgowrie, Rattray, and Alyth, within this county, are of this description; and the same remark may be extended beyond the limits of Perthshire both east and west.

SECT. III. *Climate.*

THE acceptation, in which the word Climate is here used, is not strictly philosophical, denoting a limited space, which is bounded by two circles on the Globe. It is taken in a popular sense and implies meteorological observations on the state of the atmosphere with respect to rain, wind, heat and cold, which affect the fertility of the soil, the temperature of the seasons and the health of the inhabitants, independent of the latitude of a country. The county of Perth, being situated in the middle of Scotland, is neither so warm as those in the south, nor so cold as these in the north: but as it is situated in the narrowest part of the country and reaches across the island, being farther beyond the tide way on the east coast, than it is from it on the west, it may be supposed to have all the varieties of climate, experienced on these coasts. Easterly winds bring rain and unsettled weather on the Stormont, carse of Gowrie,

rie, Strathardle, and Glenshee, while the weather is dry and serene on the west; and westerly winds waft the clouds of the Atlantic over Monteath, Breadalbane, Glenlyon, and Rannoch, while a drop of rain does not fall to the eastward. The midland parts of the county are not so much affected with a change of weather, by either of these winds, as the extremities, which lie on the opposite coasts; the clouds from either sea being generally spent, before they arrive at the heart of the county.

Clouds from the sea are fraught with vapour, in proportion to the breadth of the sea, over which they pass, because they are continually catching and treasuring up exhalations from its surface. Hence it follows, that the same tract of windy weather, and the same quantity of fog imported from the ocean, will not produce so much rain on the east coast of this island, as upon the west. Besides that, on the east coast of Britain and Ireland, and many others, the face of the country is more level (from what cause, I shall not pretend to say), and descends like an inclined plane towards the sea, having few mountains to intercept or attract the rainy clouds, in comparison of the west coast, which has commonly a bold shore, often lined with high rocks and towering mountains, with which the clouds have a violent concussion, before they have well escaped from the surface of the deep.

Where different chains of mountains point towards one another, however obliquely, with an open tract of country between the points where they terminate, that tract of country, which lies in the line of their communication, is more liable to rain, than the adjacent country, which lies on either hand, out of that line. This is owing to the mutual attraction between the clouds and each of these hills alternately; which always acts with more force, when

the wind is so weak, as not to counteract its power. The westerly clouds, therefore, which sail along the Grampians, almost due east, till they arrive at the bold headland between Drummond Castle and the house of Braco, instead of continuing their course, in the same direction, over the flat country of Strathearn, for the most part cross south east to the Ochills at Gleneagles, or north east to the hills behind Crieff and Foulis.

The clouds, which follow the ridge of the Dundaff hills, almost due east towards Touch, generally cross over the town and valley of Stirling in a northerly direction towards the Ochills, or more rarely with a southern course to the hills above Falkirk; which circumstance occasions more rain to fall at Stirling, than in the level country above or below it. The same attraction takes place in Breadalbane, between the high hills on both sides of Loch-Tay, and that range of mountains which terminates at Killin, where the clouds, in place of continuing their course right east over the lake, for the most part assume either a northern course towards the hills above Finlarig, or a southern one to these above Achmore.

The north wind is commonly cold and dry in all parts of the island; and the south wind warm and moist: yet in this county, the southern slope of the Grampians, many of the vallies within their bosom, that side of the Seedlaws, which descends into the Carse of Gowrie, and that of the Ochills, which looks down upon the Forth, are screened by these hills, from the inclemency of northern blasts; besides that, the rays of the sun fall upon places in those situations, more directly, at all seasons of the year, than upon others.

It must however be acknowledged, that our insular situation occasions such frequent changes in the state of the atmosphere,

mosphere, and such sudden varieties of weather, as baffles all calculations on this subject, deduced from fixt principles. When the causes are so unexpected and so irregular, that they cannot be traced by any known rule, the effects which they produce, must be equally capricious, irregular, and sudden.

The mildness of this climate may be inferred from a variety of circumstances, of which the following are a few. In some of the vallies of the Grampians, barley has been reaped, in good order, nine weeks after it was sown. In the year 1743, Sir Patrick Murray of Ochtertyre had his sown grafs in the rick, upon the 15th day of May, Old Style: and upon the 29th of the same month, there were six Scots pints of strawberries on his table, raised in the open garden.

The late Mr Henry Stirling at the park of Kier had, for near fifty years, kept a regular journal of the weather, marked the state of the barometer and hydrometer, and had made occasional remarks on the crops and different branches of farming, during that period. Were these papers arranged, they might merit the notice of the Board of Agriculture and others, interested in rural affairs.

The state of the weather for some years past is ascertained with tolerable precision by the two following tables, which were communicated by gentlemen of known accuracy, who reside almost in the opposite extremes of the county.

The Table of the hydrometer, the points from which the wind blew, from 1790 to 1795, both included, and the mean height of the barometer and thermometer for the three first years, were transmitted by Dr James Playfair, Minr. at Meigle, who is no less amiable for his discretion, than distinguished by his literary abilities.

RAIN. Belmont Castle.

	1790.	1791.	1792.	1793.	1795.
Months.	Inch. Dec.	I. D.	I. D.	I. D.	I. D.
January,	2.8	5.0	2.9 $\frac{1}{2}$	2.8	1.0
February,	1.0	2.7	2.0	3.2	2.2
March,	1.0	1.5	4.0	4.7	1.8
April,	1.8	1.3	1.5	1.4	4.6
May,	2.7 $\frac{1}{2}$	1.7 $\frac{1}{2}$	3.4	8.0 $\frac{1}{2}$	1.0
June,	1.9 $\frac{1}{2}$	2.3	3.2	2.5	2.8
July,	3.8 $\frac{1}{2}$	1.0	3.4	2.6	1.8
August,	3.2 $\frac{1}{2}$	3.0	5.8	3.7	4.4
Septemb.	2.9	7.0	2.8	3.2 $\frac{1}{2}$	1.7
October,	2.7 $\frac{1}{2}$	7.0	4.1	1.5	8.4 $\frac{1}{2}$
Novemb.	4.4	2.8	2.2	6.2 $\frac{1}{2}$	2.8
Decemb.	3.0	1.8	3.0 $\frac{1}{2}$	3.6	4.1
	31.4 $\frac{1}{2}$	37.1 $\frac{1}{2}$	38.4	43.5 $\frac{1}{2}$	36.6 $\frac{1}{2}$

WIND. Number of days.

	1790.		1791.		1792.		1793.		1795.	
Months.	S. E.	S. W.	S. E.	S. W.	S. E.	S. W.	S. E.	S. W.	S. E.	S. W.
January,	5	14	2	17	13	3	6	11	11	1
February,	0	10	3	4	7	10	3	15	13	2
March,	4	14	1	12	4	18	12	7	10	5
April,	10	6	16	6	10	12	15	3	14	11
May,	15	7	3	13	7	10	6	11	3	16
June,	10	12	3	9	5	12	5	16	9	12
July,	7	15	4	14	6	18	7	18	7	12
August,	3	17	10	4	12	12	5	18	7	19
Septemb.	3	14	10	9	4	19	9	13	8	14
October,	10	16	12	9	15	6	5	10	14	10
Novemb.	14	5	6	13	2	20	15	3	4	11
Decemb.	0	11	1	11	3	10	7	14	4	21
	81	141	71	121	88	150	95	140	104	134

Mean

CLIMATE.

	1790	}	29 . 59
Mean height of the Barometer in	1791		29 . 71
	1792		29 . 59

	1790	}	41
Mean height of the Thermometer in	1791		$42\frac{1}{2}$
	1792		$42\frac{1}{2}$

Height of the station of the Barometer above half-flood mark at Panbride	}	feet. dec.
		203 . 79

The height of the Barometer and Thermometer being so nearly the same, each year, it was thought unnecessary to continue the calculation.

A Table of the days which were fair, or rainy, or frosty, and in which the winds were westerly, for six years, is transmitted by Mr Edward Burn at Coldoch in Monteath, (whose farm is an example of diligence and good husbandry.) With regard to the fair weather column, Mr Burn remarks, that many days are inserted therein, which in fact were showery or drizzling, but not to such a degree as to oblige the ploughs, for example, to quit their work; so that if a deduction of 3 or 4 of the fair days were to be made for each month, the remainder might be the real number of days without any rain.

State

10

STATE of the WEATHER at COLDOCH for the Years 1790-91-92-93-94-and 1795.

Months	1790.			1791.			1792.			1793.			1794.			1795.				
	days fair	frost	wind rainy	days fair	frost	wind rainy	days fair	frost	wind rainy	days fair	frost	wind rainy	days fair	frost	wind rainy	days fair	frost	wind rainy		
January, February, March, April, May, June, July, August, Septemb. October, Novemb. Decemb.	15 11 24 26 25 17 18 14 19 23 15 11	8 2	0 15 7 4 6 13 13 17 11 8 6 10	24 27 19 8 20 25 26 22 27 28 16 18	8 6	23 15 11 10 9 6 4 9 4 2 15 12 12	21 21 27 9 20 16 24 17 15 10 14 12 26	9 13 8	9 6 23 5 5 10 5 13 5 19 10 16	11 16 23 14 15 11 16 6 19 9 15 20	16 8 3	4 17 9 4 3 6 3 12 8 13	16 20 13 14 20 28 25 24 21 20 19 20 12 13	6 11 15 17 10 4 5 7 10 17 12 10 13 5	26 19 16 26 17 23 21 26 20 24 15 11 13	5 8 23 7	1 6 1 15 12 10 8 7 5 13 12 17 18			
	218 29 118 210 219 23 123 220 189 36 141 175 250 20 95 175 230 112 196 66 103 165																			

SECT. IV. *Soil and Surface.*

THE soil of this county consists of all the varieties known in Scotland: and the surface of the ground is very much diversified.

The different soils run so much into one another that it is almost impossible, and indeed immaterial, to discriminate, in most cases, where one kind begins and another ends, with any more precision than would distinguish the limits of the colours of a rain-bow.—In giving the designation of soil, it is not meant to be chymically accurate, or that it has no other quality, but that, under which it is classed. What is meant, is, that the quality predominates, under which it is arranged: neither can it be expected, in a general account, that every little spot of any peculiar kind can be taken notice of.

The northern hills, at first sight, look barren and bold: but upon a closer inspection, they are found to be cut in various directions, by lakes, rivers, brooks, and rivulets; and the vallies between them to be warm and fertile, productive of abundant crops of corn and grafs. The southern slope of these hills is under more tillage as it approaches the plain; yet it is more exposed. The great frath between Gartmore and Meigle is in general well cultivated; the landlords and tenants understand and pursue their interest; but their efforts are attended with most success on the sides of the rivers, where the soil is more generous, and the prospect of returns more certain. The south hills, which also run across the county, are fine pasture, and have been long noted, especially that section of them called the Ochills, for producing great plenty of mutton and wool. On the south side of this range of hills, as far as this county extends, the soil in several places is at present uncommonly fertile; the farmers

mers affluent, intelligent, and enterprising; the country is crowded with villages, industry, riches, and population, keeping pace with each other.

1. *Clay.* Argillaceous earth or clay, which abounds in those districts of the county of Perth, that lie south and east, is of various colours and of different kinds; and these kinds have different properties. This soil may be considered as a primitive substance, because it cannot be decomposed into any other principle of earth, more simple than itself; nor formed by a combination of other substances.

The properties of clay, which affect agriculture most, are its *tenacity*, its *cohesion* and *ductility*. When dried by a long tract of weather, without rain or heavy dews, it becomes so hard and chopped, as to lose the benefit of any tilth formerly given it by frequent ploughings. In which case, the tender fibres of corn and grass and of other plants which do not penetrate far below the surface, are locked up so *hard*, that for want of nourishment they become shrivelled and dwarfish. Its particles are so small, that they *adhere* very closely together, by which means its surface retains more humidity than any other soil; by too much moisture the plants have a blanched appearance and become unfruitful; and not unfrequently, in a cold season, they are chilled or die. On the other hand clay is so ductile, that in a favourable season and by proper culture, its parts become very *fine* and the vegetation very powerful, because it retains moisture longer than any other land, to nourish the crop. If however that moisture be excessive, the land runs all into a fluid mass.

Along the Forth, from the bridge of Gartmore to the bridge of Allan, a tract of eighteen miles, all the flat land is a deep stiff clay, of various degrees of fertility, the blue being generally more fertile than the yellow. A great part of this soil still

is, and seems once to have been wholly covered, by a tract of moss, from six to fifteen feet deep. This valley is supposed to have formerly been overflowed by an arm of the sea: and this opinion rests on very probable circumstances, there being marine fossils dug up in various parts, and the surface of the clay being only a few feet above the present level of the tide, at high water. This horizontal stratum of clay being composed of sea sleet or sediment, accounts for its uncommon fertility*.

In the Carse of Gowrie †, all the flat land, which is a great proportion of the district, is a deep rich clay. On the skirts of the different swells, which are interspersed in the Carse, but hold in general a middle direction between the Seedlaws and the frith, the soil is of a red colour; more nearly allied however in its nature to the clay below, than to the loam on the summit of these swells, which is supposed to lie on iron ore. This soil is called *mortar*, both here and in the Stomont; probably because the houses of the farmers and of

C

those

* Upwards of 24 ploughs of carse land, the best in Britain, lies on the south side of the Forth, on the west of Stirling, called the Carse of Leekie, of which more fully elsewhere. *Ignotus*.

The Carse of Leekie does not consist of 24 ploughs, and this report has no more concern with that Carse, than it has with Nova Zembla. This person, in all his remarks, has had more keenness than courage. It is an irksome task, to be obliged to answer the criticisms of those, who neither understand what they wish to censure, nor have fortitude enough to subscribe their names.

† Clay soil in Scotland is generally called Carse. Some persons object to this designation, as not classical English; but whoever writes of local circumstances must occasionally employ local phrases: The word *Carse* is not however so barbarous as is supposed. In Bailey's Dictionary, *Car* is said to be old English for *Pool*. *Carre* signifies woody, moist, or boggy ground: and the word *Cars* in Lincolnshire and Yorkshire is in general use, and applied to the same kind of soil.

those in the lower ranks of life were formerly, in these and other parts of the country, composed of this mortar or tilly clay, owing to the scarcity of stones for building.

The next greatest tract of clay, within the compass of this survey, is from the bridge of Forteviot, on the Earn, to the confluence of that river with the Tay, at the Rhind, where they meet. The soil in this tract is chiefly of a pale brown; owing probably to the mixture of fresh-water sediment carried down in great quantities by the river, which being at first superinduced over the other soil, is now by the action of tillage incorporated with it. At a considerable depth below the surface of the land, in the vicinity of the Bridge of Earn, there is a stratum of moss, said to be from one to three feet thick. This moss, like all others, must be composed of rotten vegetables, especially timber; and that timber must have grown out of the soil below the moss.

There is a small tract of the same kind of soil at Gogar and Menstrie on the Devon, and its nature and appearance may be owing to similar inundations in that river.

In some places about Coupar Grange, there is a strong stiff mould, approaching nearer to clay, than any other designation of soil. A deep till, after it is wrought, approaches very near to the qualities of clay. It is easily poached, holds water on the surface as in a dish, and is itself with difficulty dissolved in water. On the banks of the Isla, particularly about Bendochy, there are some spots, where clay prevails; but wherever the river overflows, it has a mixture of haugh, owing to the fine sediment deposited occasionally on the surface. This mixture constitutes a soil of great fertility. The sediment helps to correct the tenacity of the clay, and is itself of the nature of virgin earth, added annually to the staple of the soil.

About

About the town of Perth, there is a rich soil, which resembles very much the qualities of that last mentioned. In that district, which lies betwixt Perth and Dunkeld, on the west side of the Tay, some clay is also to be met with: but in a general account, extreme minuteness is not to be expected. It might even be deemed improper to enumerate every little patch of stiff soil, in various parts of the county. Wherever silt has been deposited by waters, which at first were flowing and then stagnant, especially if their course has been long; there we find a strong rich mould, whose particles are fine, glittering after the plough, and whose nature is cohesive, being impervious to water in a high degree. And yet if it be composed not only of silt, but of rotten vegetables, which is the case with all marshy land, where weeds have grown, it must have a proportion of calcareous earth; and therefore ought not strictly to be called clay.

2. *Haugh.* All the land, which has been occasionally flooded, time immemorial, is commonly called Haugh. Wherever rivers and large brooks do not flow from lakes, of sufficient capacity to serve as reservoirs, for holding the torrents from the higher grounds, they are liable to swell suddenly, to overflow their banks, and to deposit a great quantity of sediment on all the flat land within the reach of these inundations. Where the current is rapid, beds of stones or gravel are left; where it moves slowly, sand is deposited; and where it becomes stagnant, the sediment is composed of the finest particles of earth. The degree of its barrenness or fertility depends uniformly on the nature of the soil carried down by the stream, and on the rapidity or slowness of the current. There is a considerable extent of this haugh-land wherever the Earn flows beyond its ordinary

C 2

channel.

channel. It also abounds on the Pows, on the Allan, on the Goodie, on the Devon below Dollar, and in various parts of the parishes of Balquhiddy and Callander. On the Isla, where it holds a westerly course, the haughs are uncommonly rich and extensive; there are a few at the mouth of the Ericht, the west end of Loch-Tummel, and that tract, known by the name of Bunrannoch. In various parts of the long course of the Tay, there is soil of this nature, especially for some miles before its junction with the Isla, in the vale of Athol, and in a less degree in other places. At Killin, Glendochart, Strathfillan, Glenlochay, and almost in every part of the county, where the rivers are in the predicament above described, there is less or more of this kind of soil.

Rivers, which flow from lakes, form no haughs, until they have run so far as to become muddy by the addition of other streams. Should they overflow their banks near the lakes, from which they issue; their effect, in respect of fertility, is less powerful; the meliorating sediment having, in a great measure, been left behind.

Grass lands are more enriched by this kind of manure, than land in tillage; because the former gains much, and loses nothing; whereas the latter may lose more soil, than it gains, if the water has considerable velocity.

3. *Loam.* The loam, in most situations, is so much interspersed with other soils, that it is impossible to describe it accurately, without being too minute. Whatever may have been the original quality of a soil, if it has been long in tillage, and enriching manures, consisting of animal and vegetable substances in a putrid state, added to it for ages, it becomes Loam; as may be seen round all the burghs of Scotland. This change takes place sooner in light land, than in that which is stiff.

There

There is a fine bank of loamy soil, of considerable length, from Rednock-house to Blair-drummond. On the higher banks of the Earn, beyond the flat land, which has been either flooded or traversed by the river, there is a long tract of loam, interspersed in different places, with a mixture of till or clay. Adjoining to the haugh on the sides of the Wester Pow, from Methven to Inverpafry, there is a stripe of fine loam. That on the north side lies on a bed of rock marle, which crumbles down when exposed to the air, and forms a good soil of the same colour with the rock; which some farmers call motherstone soil. Around Kier, Muthil, Auchterarder, Dunning, and many other places, this soil is very frequent.

Much of the land on the skirts of the moors of Glenshee, of Orchill, of Maderty, of the forest of Alyth, at Banff, and in similar situations, is called Loam; but a great proportion of it is of an inferior quality, having a mixture of peat earth on a gravel bottom.

There is loam at Tullyallan, in the neighbourhood of Culrofs, and in several places of that district, which have been for some time under a proper system of cultivation.

In that tract of country betwixt Dunkeld and Perth, especially in the parish of Auchtergaven and southward, the loamy soil prevails. The soil upon all the eminences in the Carse of Gowrie is loam, except in some places where the summit may approach to till and the skirts to clay, as mentioned under a former article. The south aspect of the Seedlaw hills is covered with a rich mould, loose and tender, which yields easily to the share.

In describing the soil of Strathmore eastward to the frontier of the county of Perth, it is necessary to premise, that the Isla holds its course in the middle of the district, almost

at an equal distance from the Seedlaws on the south, and the Grampians on the north. Between the base of each of these hills and the river, there runs a long ridge of moor, parallel to the river and hills, which, with very little interruption, extends nine or ten miles, from the bend of the Isla opposite to Meigle, to Kinclaven, where it discharges itself into the Tay. The whole district is thus divided into four stripes of better soil, besides the two ridges of light or moorish soil, which lie midway between the river and the mountains. The two stripes at the base of the hills, by Newtyle on the one side, and Alyth on the other, are for the most part a red or black soil of good quality. The two on the ridges are lighter soil, except where crossed by brooks; much of it, either peat earth on a bed of till (provincially mortar), or sand, or gravel. Part of it is in a state of nature, part of it reclaimed, and part of it now in a course of successful improvement, particularly the property of John Smyth, Esq. of Balharry *. The two stripes next the Isla are excellent soil, already taken notice of; loam on the declivities, and on the level, haugh and some clay.

At Meigle, which is situated in the extremity of the south ridge of moor, and at Coupar in the center of it, the soil is a rich loam of a deep red colour. The soil at Jordanstown on the opposite side has much of the same appearance and quality.

Towards Dunkeld, on the north side of the Tay, the soil is mostly loam on the skirts of the lower hills, and on the flats between them. On the bank, where the old house of Blairgowrie is situated, which runs also behind the house of Ardblair and westward, there is a fine red loam: beyond these places the country is very much diversified, and the
soil

* See Appendix, N^o 3.

foil of different qualities. About the middle of Strathardle, a deep red loam prevails. Glenfernet has foil of the same colour and quality, but somewhat lighter in its texture. At Ashintully, Bleton, Glenbriarachan, and the forest of Cluny, there is much of this red loam mixed with gravel and sand; the declivities inclining to the former, the flats to the latter. In general the most of the arable ground behind the lowest hills, from the water of Erich as far east as this county extends, is of that complexion, and is provincially called mortar.

From Scone northward along the banks of the Tay, there is a fine loamy foil, increasing in fertility according to its vicinity to the river. Back from the river, the land is mostly till.

4. *Till.* On the declivities of almost all the hills a strong stiff till abounds. That red cohesive foil, in some parts of the Carse of Gowrie, Strathmore, and Stormont, which is termed Mortar, is no other than what is known in books upon agriculture under the designation of Till. In the neighbourhood of Stobhall, the general texture of the foil is a deep, stiff, red mould. A poor kind of till covers all the north face of the Ochills, from Dunblane to Abernethy, a tract of at least twenty miles. The skirts of the moor, which lies betwixt the Forth and the Teath, and terminates a few miles from their junction, is a wet, unkindly till, especially the land above the public road on both sides: and a great proportion of the land on either side of the loch of Monteath is a wet, tilly foil; but in both these tracts, many places have a fall, and ought to be drained. On the north brow of the Seedlaws, the foil in general is tilly. This remark applies to the north side of most hills, where the foil is cold, deep, and spouty; while that upon the south consists of a mould,

moor

more light, generous, and dry. The finer grasses are consequently found on the southern declination of hills. The cause may be, the genial influence of the sun, the balmy south wind, and warm showers from that quarter.

There is a red kind of till about Auchterarder and Dunning, of a quality superior to the former, and capable of high cultivation. On the face of the bank, and above the public road, from Methven to Ferntown, on a similar bank near Kier on the Teath, and in various places of the Nairn estate and of the Stormont, there is a similar soil on a bed of rock marle, which is very productive, approaching perhaps as near to the qualities of loam, when well cultivated, as it does to that of till. This soil, which is formed from rocks that are easily pulverized by the alternate action of frost and thaw, of rain and wind, is the best species of till; and, as was mentioned above, is called by some persons mother-stone soil. It is commonly to be met with on sloping land, lying upon rock which is easily crumbled into powder. Towards the bottom of these slopes, the soil is deep, rich, and mellow, while the top is as stiff, thin, and barren, as any till whatever.

In all the provinces of the county of Perth, the red loam and red till run insensibly into one another, the line of their separation being altogether indiscernible. Their principal difference is, that the loam has been longer cultivated, better wrought, and more manured.

Where the rocks are friable, which is the case with the red rocks of this county, the soil, as in all the tracts here alluded to, is of the same colour with the stone from which it has been formed, and is of a good quality. This soil of a deep red colour is found, with few interruptions, stretching all the way from Laurence-kirk to Dunbarton, and makes its appearance

pearance again in the Island of Bute. It is universally found that mines run in chains, in this direction; but it is not so common with regard to soils, except they be formed from the rock on which they lie.

In some parts of the Highlands of Perthshire, there is a soil lying on limestone-rock, which is uncommonly rich, because it is formed of that rock, and consists mostly of calcareous matter.

Wherever the stones or rocks are granite, if the soil be wet, which happens, in most cases, on the face of hills that are not very abrupt, there is a pale coloured till, which is more barren, and more difficult to be drained, than the red. Of all soils, this is the most unfriendly, the most reluctant to reward the labours of the husbandman, and its natural sterility the worst to be overcome, especially where there is little or no fall, to encourage draining. Till of this nature is found on both sides of the Allan, at Kinbuck, in the Glen of Condie, in the back grounds of Culrofs and Tullyallan all the way to Blairingone, in the hollows among the Seedlaw hills, in Glenshee, Glenisla, Glenqueich, Glenalmond, and less or more on the lower declivities of hills, in all the glens of the Highlands.

Stiff deep till has nearly the same affinity to clay, that good till, meliorated by a judicious system of husbandry, has to loam. The distinction is, however, more discernible in the former than in the latter instance. Till is generally spouty, and requires to be drained below the surface, whereas clay requires only surface drains, having few or no springs below. The one is almost universally level, and has often a mixture of haugh in the vicinity of rivers; the other is often sloping, or in gentle swells, underneath higher ground, from which it is infested with subterraneous springs.

5. *Sandy or Gravelly Soil.* Light free soil, easily pulverized, of which a great proportion is sand or gravel, is the most frequent in Perthshire. All the vallies north of Alyth, Blairgowrie, and Dunkeld, and west of Crieff*, Callander, and Gartmore, consist mostly of this light soil, except, where at the mouth of a brook, which discharges itself into a larger stream; or under the inundations of a river, the land is occasionally flooded and haughs are formed; or on the sloping face of hills, where the soil is spouty; or on the confines of moors, where the soil is a mixture of peat earth. There is a considerable tract of this soil about the head of the Allan, along the Machany, at the foot of the Ruthven and May. Near Muthil, the soil is partly till, and partly light. Round the muir of Orchill, about Monzie, on both sides of the river, at Crieff and Monivaird, there is generally a free and trusty soil; and from Doune to Callander it is nearly of the same quality. There are other tracts of light land in the parishes of Muckart and Glendevon. A gritty soil is to be met with on the north side of the parish of Gask, and in general on that ridge of high ground betwixt the Pow and Earn, where it is free of moss, and not flooded by small streams.

Betwixt Coupar and Meikle, along the sides of the public road, there is a considerable tract of light sandy soil, much reduced, by being overcropped after marle. At Rattray, and for some miles eastward, the soil is gravelly, naturally poor,

* The soil of Garaw Cheru, a farm west from Comrie, is very heavy carse. *Idem ignotus*.—I believe that it is rather haugh, formed by the confluence of two brooks, according to the exception mentioned in this very sentence. But even supposing part of that farm were clay, such extreme minuteness as referred to every little patch of land would swell this report to the size of the universal history.

poor and thin. At present it is very much neglected; but under proper cultivation, it might make better returns under green crops. Below the village of Blairgowrie, the soil is uncommonly thin, lying on a bed of gravel,—an ample field for the application of some money and much industry. The low fields westward have much of a similar complexion, while the swells are rich land and arable to the top. Between Scone and Cargill, on the higher grounds, there is light land; also north and west of Auchtergaven on one side of the Tay, and in the neighbourhood of Delvin on the other; the former having more gravel, the latter more sand. Land of this texture would yield excellent green crops, and would make good returns in grass; but it is altogether unable to bear constant cropping with grain. It appears unnecessary to be more particular.

6. *Moss and Moor.* In every flat, and on some slopes of the higher hills, there are mosses of various dimensions, of various depths, and of various degrees of firmness, according to the time that has elapsed, since the moss began to acquire solidity. In the Highlands, mosses are so frequent, that it would be tedious to enumerate them. Their formation is uniformly owing to the same cause—fallen trees, the deciduous parts of heath and of strong aquatic plants. The largest tract of moss, in a valley, any where in this county, and perhaps in Britain, is in *Monteath*, which has given its name to a whole stewartry. It is also called Moss Flanders, from its flat appearance, and is most commonly known by that name. This whole tract of moss, from the bridge of Gartmore to the bridge of Drip, may be computed at 10,000 acres*.

D 2

It

* Some time ago, a man of money ploughed the surface of it, after covering

It has been remarked under a former article, that there is a stratum of moss, buried several feet below the surface of a rich soil, near the mouth of the Earn. A variety of timber is found lying in that moss.

If the soil below Moss-Flanders and this other moss in Strathearn, has been formed by the agitation of the sea, which is very probable: whenever the waters retired, such a luxuriant soil could not long remain unproductive. It must have been sown without delay, by the hand of nature, with the seeds of the plants growing around it. Of these, the oaks and other forest trees, being the most vigorous, would in a few years overtop and choke the rest. Time itself and the violence of winds, are sufficient to overturn any trees: and when trees are felled on flat land, where their leaves have been accumulating for ages, the leaves and branches dam the water; aquatic grasses grow; the place becomes a morass; and every morass composed of such substances, by acquiring solidity, becomes a moss. These are the outlines of the most probable opinion of the manner in which Moss-Flanders was generated*. The roots of oaks are found at this day,

covering it with clay; but though pease and barley were forced to grow for a few years; yet the undertaking failed, seeing no sward continued to cover it.—The sea-ware in the western isles produces a strong sward, which is never lost after; a proof that ashes mixed with earth are not so effectual, though more expensive. *Idem ignotus.*

The story here alluded to is mentioned in Maxwell's Agricultural Essays; and Mr Graham, the undertaker, so far from being a man of money, ran in debt and fled the country. The critic ought to have proposed to bring sea-ware from Inch-keith rather than from the western isles, to improve Moss-Flanders, which is a much shorter carriage. He shoots indeed in the dark, but it is a mercy that he does not charge with ball.

* See this opinion illustrated and confirmed in the ingenious account of the parish of Kippen. *Stat. Account of Scotland*, vol. xviii. p. 317.

day, sitting in the very manner they grew and adhering firmly to the clay, and trunks of immense size lying near the roots, at the depth of fifteen feet below the surface of this moss.

The same reasoning applies to the moss at the mouth of the Earn, where there is little doubt that the same phenomena lead to the same cause. But it will probably be asked, how came so many feet of soil to be laid over the latter, while there are few places, in which any good soil covers the former? The Earn is a more rapid river than the Forth, has a longer current, and therefore carries down a much greater quantity of soil from the higher grounds. It does not begin to be still water, before it arrives at the place alluded to, where it becomes regularly stagnant, by the opposition of the tide; and consequently must deposite the sediment in that very spot, where it ceases to flow with rapidity. This sediment being accumulated for centuries, has formed the soil, which covers the moss. On the banks of the Forth, the same effect has taken place, as far as the influence of the cause could extend. At Killorn, the Easter and Wester Polders, and other places, where the river becomes still, the mud subsiding from the troubled water, has formed stripes of culturable soil. About 12 feet below the surface of these stripes and in the face of the bank at the river edge, the stratum of moss is seen, with trees of different sizes lying between the clay, on which they grew before the moss was formed, and the soil which the river has now brought down to cover the moss. This fact rests on undoubted information, and seems to be conclusive as to the similarity of the causes which formed the flats at Abernethy and Monteath, both as to moss and clay, and the relative situation of these strata.

A thin stratum of moss, where the subsoil is gravel or sand, is called *Moor*. The culture of this soil is extremely diffe-

rent

rent from that of moss; and the culture of one moor from that of another, according to its depth and the nature of the soil below: The moor of Orchill, which may be computed to be about 10,000 acres; the Sheriff moor, which may be reckoned two thirds of that extent; the moor of Dollary, which stretches eastward very near to Perth, and has only some straggling farms scattered in the most fertile spots; the moor of Methven; the moor of Thorn, south from Dunkeld; the moor of Elyth, which is very extensive; the moor around Dunfinnan, which is both broad and long, with a few farms in the most favoured spots; some patches of moor in the Carse of Gowrie, which lie on a bed of till richer than the subsoil of the moor of Dunfinnan, although of a similar colour; some moor also in the back ground of Culrofs, at Dalgarrofs, at Doune, and Callander: All these crave the attention and industry of this enterprising age. On some of them, spirited improvements are now going on; and the means of improving the remainder will be pointed out in the sequel.

Mr Marshall, in his Survey of the Central Highlands, makes a comparison between the moor lands of Yorkshire, and the hills in the Highlands; which shall be given in his own words.

“ The soil of the hills of the Highlands of Scotland, compared with that of the moor lands of Yorkshire, has a decided preference; unless upon the summits of the higher mountains, and where the rock breaks out at the surface; or where this is encumbered with loose stones or fragments of rock; the hills of the Highlands enjoying some portion of soil or earthy stratum, beneath a thin coat of moor; while on the Yorkshire hills, the moory earth, generally of greater thickness, lies on a dead sand, or an infertile rubble, without any intervening soil.

“ From

“ From the sort of general knowledge, which I must necessarily have of both districts, I am of opinion, that the Highland hills (apart from the summits of the higher mountains) are of three or four fold the value of the eastern moorlands of Yorkshire; more especially of the central and southern swells: the narrow tract which hangs to the north between Guisborough and Whitby, is of a better quality; very similar, in soil, to the lower hills of the Highlands.”

SECT. V. *Water.*

SO much has been said in the topographical * description concerning the rivers and lakes of this county, that any remarks to be made on this article will not be tedious. In all the hilly parts of Perthshire, the water is not only plenteous, but of the finest quality, descending from springs in the face of the mountains or rocks, in streams, pure as crystal; but the case is different in the level parts of Monteath, Carse of Gowrie, and a few other places in similar situations. There, as may be expected, water is more scarce and of an inferior quality; the flatness of the country prevents springs, and running streams are rare. In dry seasons, the water is frequently dried up or ceases to flow, and the effluvia of putrid ditches are extremely nauseous and injurious to the health of the inhabitants. In wet seasons, their situation is little better. The whole land is one great mire; every tread of the foot of man or beast forms a receptacle for holding water. Hence agues, rheumatisms, and a train of similar intermittent diseases, which infested the people in these countries, before the land was drained.

Mills

* The author intended that the Topographical Description of the county should appear towards the beginning of the volume, but the Board of Agriculture advised to make it N^o 1. of the Appendix.

Mills of various kinds are driven by the different streams. Bleachfields and printfields are occupied on the Tay, the Almond, the water of Lawtown*, and other places, where the softness of the water and a variety of local advantages are inviting.

Although this county, strictly speaking, be inland, yet it has as much of sea coast, in the friths of Forth and Tay, as enables the inhabitants of Perth, Kincardine, and some smaller towns, to carry on a considerable trade. The principal exports and imports at the shore of Perth and the villages connected with that custom house, may be seen in a Table; Chap. xv. Sect. 5:

Pitcaithly is famous for its antiscorbutic waters. There are five distinct springs, used for drinking and bathing; all of the same quality, but of different degrees of strength. This water has been long celebrated for its efficacy in curing or alleviating the scrophula, the scurvy, &c. is of a cooling quality, strengthens the constitution, cleanses the blood, and relieves the stomach from crudities. The time when it was first discovered, cannot be ascertained with certainty; even tradition is silent on that subject. A chymical analysis of this mineral may be seen in the Statistical Account of Scotland, vol. viii. p. 406.

Having taken notice of waters, which are in high estimation for real properties, it may not be improper to give also an example of waters, which have obtained fame, for qualities, that are at least in a high degree, if not altogether, imaginary.

The pool of St Fillan, on the confines of this county towards

* Mr Wright the proprietor told me that this was the place, where Macbeth held his courts of justice, while he inhabited his strong hold on Dunfinnan-hill.

wards Argyleshire, was much resorted to in former times, and has still some degree of superstitious credit, as being highly sanative, under almost every disease. The time of bathing is the first day of a quarter old style or the 12th new style, generally the beginning of summer or autumn, when the day is long and the weather fit for travelling. Three different times must this pilgrimage be performed; and crowds of the halt and maimed, of the consumptive and insane, and of persons afflicted with the various diseases which used to be ascribed to witchcraft, resort thither from a great distance in this and other counties. The chief ceremonies at the pool, are bathing thrice, going thrice round each of three cairns of stones, in the direction of the sun's apparent motion*, and being left bound in St Fillan's chapel, if the patient be insane. The credit of this superstition is daily declining: yet as a watering place, the change of air, which in this high region is extremely pure and salubrious, the exercise, the season of the year, the bath impregnated, in a certain degree, with a mineral, and above all the powerful influence of imagination, often produce the restoration of health, and have a surprizing effect upon the credulous multitude.

Wherever St Fillan travelled, in his peregrinations through these countries, he consecrated different fountains, where the water is found to be light, and possessed of a superior quality, which are therefore still held in high esteem.

SECT. VI. *Minerals and Fossils.*

IT is singular, that although most of the counties in the south of Scotland abound in mines of *Pit-coal*, yet none has hitherto been discovered north of this county. The Ochill hills,

E

crossing

* *Deas-iul.* The right or lucky way.

crossing the county ; and the same chain under other denominations, crossing the counties of Stirling and Dunbarton on the west, and these of Fife and Forfar on the east, form a great dyke from sea to sea, which seems to be the barrier, that Nature has placed between the coal countries and these which have none. Every effort has been used to make a discovery beyond this dyke, and men of the first experience have been employed ; but hitherto without any probability of success.

From Blairingone (*the field of bounds*), which is the property of the Duke of Athol and situated on the south side of the Ochills, the adjacent country, the west end of Strathearn, and part of Breadalbane, are supplied with this useful fuel, in addition to their peats.

An account of the ingenious experiments of the Earl of Dundonald, who built ovens of a peculiar construction, for burning the pit coal of his own and other estates into coke, and at the same time preserving the oil and tar in separate receptacles, might perhaps, although within the bounds of this county, be deemed foreign to the object of this Report. Coke has been long in use, and found well adapted to excite a most intense heat in smelting ores and in other chymical operations. It is also calculated for drying malt, to which the acid, the oily particles and phlegm of uncharred coals would be detrimental. The merit of procuring coke and at the same time of preserving the other useful ingredients, formerly lost in charring pit coal, is justly due to that nobleman.

It appears to be highly probable that coals were discovered by the inhabitants of this island, before the Roman invasion, from circumstances taken notice of by some historians ; but while the forests were extensive on all hands and

of

of little value, the fuel in common use was wood. As the latter became scarcer, the people had recourse to the former. The first public notice taken of this matter by government was in 1272, which is the date of a charter granted by Henry III. to the town of New Castle.

The district of Culrofs not only claims the invention of extracting pitch from coal, but the most singular coal work ever seen in this part of the world was carried on near that place. In the middle of the frith and under the sea, opposite to Kincardine, a round wall was built, higher than the sea at full tide, inclosing the mouth of a coal pit, where ships drawing 12 feet of water received the coals from the bucket. A disastrous accident, occasioned by an uncommon swell of the sea put an end to this undertaking.

In the year 1792, a small subscription was raised in Strathearn, to defray the expence of searching for coal in the property of Lord Perth, near Auchterarder. Favourable symptoms were then discovered by persons, acquainted with this business, who reported, if a thorough search were made by boring, that they had no doubt of coal being found in that moor.

Limestone has been discovered early, and much used in many parts of this county, especially towards the Highland districts. As a cement in building walls it has been long used, and came in place of sea shells; its application to the soil as a manure does not seem to be prior to this century; and its general use in this respect is within the remembrance of persons now alive.

Nature, in this instance, as well as others, distributes her gifts with a judicious hand. Where the soil is of an inferior staple, we have abundance of lime; where the quality is superior,

perior, lime is generally more remote and procured at greater expence.

Rannoch, Glenlyon, Breadalbane, Strathyre, have inexhaustible rocks of limestone, which is uniformly of a grey colour. At the west end of Lochearn the same chain of rock appears also above ground. At Callander* and Aberfoil the stone has a blue ground, variegated with beautiful streaks of white; but the veins are smaller and have dipped so much, that it is probable these quarries will soon be given up. In the parish of Port of Monteath two quarries have been discovered, one at Drunkie and another at Letter; a third has been tried at Glenertnay in the parish of Comrie; but none of these have been prosecuted. In Strathardle and Glenshee the discovery of limestone has not been attended with the advantages it might produce, by reason of the scarcity of fuel; except at the mill of Fyel, on the estate of Sir William Ramsay of Banff, where more is burnt, than in any other part of these districts.

The most considerable limework in the Stormont is on the south side of the Loch of Clunie, belonging to Mr Kinloch of Gourdie. This quarry seems to be inexhaustible; and it has fallen into good hands; which circumstances united promise much benefit to that country. A great draw-kiln of a very proper construction was building at this place in Oct. 1795, during the time of this Survey. The greatest inconvenience attending this operation is the distance of coals; but when the bridge is finished at the mouth of the Isla, and the turnpike road

* Besides the lime on the estate of Leney near Callander, another fine quarry is broke upon in the braes of Leney, belonging to Captain Drummond of Perth. *Idem ignotus.*—It is so fine that it was wrought only for two or three years and was given up as not worth the expence, before the Board of Agriculture was established.

road completed from Perth to the Stormont, the carriage of coals will be much facilitated and this spirited undertaking meet its due reward.

Lime has also been burnt and used in small quantities from quarries at Cargill, at Craigmakinnan, and in the parish of Longforgan at Lawriston; but in these and several other places within the extensive range of country mentioned above, the full benefit arising from the discovery of limestone is not reaped, owing to the distance and scarcity of fuel.

On the estate of Struan, in the district of Rannoch, a mill or machine was erected; some years ago, by the late commissioners of annexed estates, for the purpose of pounding raw limestone for manure.

Mr Stewart of Crossmount, who favoured me with the account of this lime, which is taken down in the chapter on manures, adds with regret, that the water was too scanty, otherways the machine would have pounded a greater quantity; and that before the consequences of this experiment were diffused and felt in the country, a torrent in the stream that drove the machinery, was allowed to sweep the whole away; which accident put an end at once to future trials and future benefit.

This is a matter of great importance, not only to the Highland districts of this county, but to every other district and county, where limestone is plenteous and fuel scarce; and it is to be hoped, that the Board of Agriculture and the proprietors of the Highlands of Perthshire will take it under their serious consideration. What might not be done to improve that country, were machines of a proper construction invented, intrusted to proper persons, and set upon some of the brooks, which run down by the side of every farm!

Strathearn and all its branches have no quarries of limestone:

stone: around Perth to a considerable distance in all directions there is none: yet the spirit of improvement is so general in that neighbourhood, that the farmers purchase lime at the shore of Perth, and elsewhere, at very high prices, and carry it far into the interior parts of the country. The effects of lime, when judiciously applied, as a manure, are so beneficial, that the face of this country is greatly changed, since it came into general use; which will be taken notice of, when we come to treat of the subject of manures.

Slates are found in many parts of the Highlands of Perthshire, but none in the low country. Some are of a purple colour, some of an azure blue, and some of a muddy brown complexion along the cutters. It were easy to mention the various places, where each of these kinds of slate is quarried. The vein of slate-rock seems to run from Drumlane in the parish of Aberfoil, in a north east direction to Dunkeld; and may be traced beyond the limits of this county both ways. The azure are the best metal, and rise of a greater size than any of the other kinds. Many of the villages are ornamented with this beautiful covering: The brown flags, laid on some of the houses in Auchterarder, Crieff and Muthil, which were at one period used so much in covering houses in many parts of Scotland, scarcely make an exception. Into the lower districts of the county, slates are imported from Isdale and the other quarries on the west coast of Argyleshire.

The granite rocks, which form the mountains of the north and west, are much akin to the nature of slate; and the freestone of the southern level country, to that of coal. It is likely, both the one and the other has been formed from the contiguous masses of stone, with which they are in contact; notwithstanding the problematical opinion adopted by

some writers, that coal is a vegetable substance. But conjectures must not be indulged, when our business is to detail matters of fact.

Great abundance of freestone has been wrought, time immemorial, in the low parts of the county; and quarries of a greater or smaller grain, appear almost in every place, except the Carfes. In the low land, and near the eastern sea, the pores and grain of the freestone are greater; and as you approach the mountains, the pores are less and the grain finer; whereby these stones admit a smoother polish.

The quarry of Long-annat in the parish of Tullyallan, near Culrofs, affords stone of a very excellent quality. It has a white colour, admits of a smooth polish, and resists the influence of the weather. Besides the principal houses in that country, some of the most magnificent public buildings in the capital, such as the Exchange, the Infirmary, the Register-office, consist partly of this stone, in addition to those found at hand: and in some instances, it has been carried to the continent of Europe.

The quarry of Kingoodie, in the Carse of Gowrie, the property of Mr Mylne of Mylnfield, is unquestionably the finest of this kind in the county. Many astonishing blocks are raised at Kingoodie, 50 feet in length, 16 feet broad and 3 feet thick. It affords also flags, which are thin enough for pavement. The colour is gray, and the polish remarkably fine. Between 50 and 60 labourers are employed in the quarry, whose families amount to the number of 116 souls. Such is the demand for the Kingoodie stone, both at home and abroad, that four vessels are employed in the exports from this quarry. But it is much to be regretted, that the work is on the decline, occasioned by the late act (in 1794), imposing a duty on stones. The duty is trifling;
but

but the grievance arises from the vexatious delay and trouble in procuring coast dispatches.

A copper mine has been wrought at Aithra. A lead mine was carried on many years near Tyndrum in Breadalbane; but it has been lately given up. Some lead ore was discovered, not many years ago, in Benledi * near Callander. Of all these, the mine on the Earl of Breadalbane's property was the only one, which was ever wrought upon a large scale or with any profit.

In an account of the useful fossils of this county, mention ought to be made of a very valuable clay discovered on the estate of Blair Castle and other places near Culrofs, which is equal, if not superior in quality, for pottery and glass-house purposes, to that brought from Stourbridge in Worcestershire. It is found in extensive and deep beds. The public are indebted to the present Earl of Dundonald for the discovery.

A ridge of rock, three feet thick, where it is seen above ground, runs across the strath of Monteath, from the house of Leckie northward by Craighead, and makes its appearance again on the bank of the Teath, near to the boundary of Mr Murdoch of Gartincaber with Torry. A gentleman, who was a connoisseur in mineralogy, says that it is steatites, commonly called rock-soap.

There is plenty of iron stone along the coast below Tullyallan;

* While this Benledi belonged to government, a vigorous attempt was made to discover a *silver* mine, but the expence likely to be incurred, made the managers of the forfeited estates give up the project, even after meeting with many promising appearances of ore. *Idem ignotus.*

There were appearances of a *lead* mine, but none of a *silver* mine. The commissioners of annexed estates would have grudged no expence if the appearances had been *promising*.

allan ; but the expence of labour and of carriage, in working these quarries, is so great, when compared to those near Carron on the south side of the frith, that the former are given up.

Shell marle abounds in the Stormont and has been long and plentifully used ; in Strathearn it has been discovered more lately and more sparingly used ; but its uses in agriculture will be treated of with more propriety under the article of *Manures*.

CHAP. II.

STATE OF PROPERTY.

SECT. I. *Estates and their Management.*

THE proprietors of this extensive and opulent county are of all the different ranks in society, known in this island, which distinguish from one another persons having a property in soil.

The noblemen have large estates ; which enable them to support their dignity with splendor and to perpetuate the hospitality of their ancestors. Many of the gentlemen have independent fortunes, gratifying a taste for elegance suited to their improved ideas and their rank in life. There are few or no counties in Scotland, where the commoners are more distinguished by their education, their manners, their enlarged views, the love of their country, and the extent of their property. These among them, who are not engaged in the arduous departments of government, of law or military affairs, live for the most part upon their estates, have a

F

pleasure

pleasure in embellishing their residence, and ornamenting the country around them. Not a few of them superintend the improvements of their own tenants; and by condescending to reason with the country people, remove their prejudices against new modes of culture, teach them to discern their true interest, acquire their confidence and esteem, and are regarded as the fathers and friends of every person within their domains. While the supercilious landlord, who, with an air of disdain, keeps his tenants at a distance or does not know them at all, scarcely receives the cold salute and ceremonious bow, which is due to rank; he, who bends a little and exchanges a few kind expressions, receives the respectful salutation of esteem, accompanied with the affectionate language of gratitude. The most beloved and the most successful generals, were those, who knew their soldiers personally. No man is less dignified for being beloved; and it lessens no man's consequence in the world, to have the confidence of those around him. Hence the generality of proprietors, who are resident on their estates, lead their tenants by the hand, in the road of improvement and of wealth; and have found the true secret, of promoting their own interest, while they promote the interest of their people.

Under the feudal system, the management of estates would be but little attended to: a property acquired by force of arms, must be kept possession of by the sword. It was therefore more necessary to train the tenantry to war, than to rural improvements.

On the large estates, there was an officer, next in authority to the proprietor himself, who under the name of chamberlain, was at once minister, general, and manager of the estate. The farms were divided and subdivided to make room for a greater number of soldiers, and were frittered
down

down into these small holdings, in which they are now found; in which circumstances no solid improvement could ever be expected to take place.

The great estates are divided into officiaries, each consisting of an ancient barony, or a tract of land sufficient to entitle the possessor to the privileges of a baron of the realm, provided he held his land of the crown. In each of these districts resides a ground-officer, from which circumstance they have derived their modern appellation. This officer is generally a principal tenant, whose duty is somewhat similar to that of the bailiff of an English manor, but more extensive and more useful: he not only conveys orders from the lord or factor to the tenants; but sees the services performed (from which he is himself exempted), the roads kept in repair, the removal of tenants, the settling of disputes, the forwarding of dispatches, &c. In short, the ground officer is both eyes and ears to the principal manager of an estate; and if he be a person of discernment and integrity, it will be more safe both for landlord and tenants to trust to his information than to vague and unfounded reports.

Even where one barony is split down into several properties in the possession of different landlords, one ground-officer is generally chosen to serve for the whole: and in other cases, where one proprietor has two or more baronies contiguous to each other, he employs only one officer. The district under his inspection is merely arbitrary, depending, in all cases, on the pleasure of his employer.

The officers being always resident within the bounds of their respective officiaries, have a more intimate knowledge of the various transactions of merit or demerit in their own neighbourhood, of the disputes between tenants, of the character of parties and of all other matters, than it is possible

either for the proprietor or the agent upon a great estate to have : and if a manager distinguish properly between the useful information they are capable of giving him, and the partialities, which they must necessarily have among the tenantry of their respective districts, he may, on many occasions, render them highly useful in the due performance of his charge ; which is a matter of no small importance, where the happiness of thousands depends more or less on his conduct.

Besides these officers, there are sworn appraisers or valuers (called Byrelawmen) in certain districts, commonly in each officary, who are called mutually by each party, to settle disputes between landlord and tenants, or between one tenant and another. These petty inquests are extremely convenient upon an extensive estate, and might well be introduced in their present or in an improved form, upon the larger estates of the island in general. Their decisions are of the nature of a decret arbitral, and are for the most part, in case of an appeal, affirmed by the justices of the peace or by the judge ordinary of the bounds.

In the management of estates in this county, and in every county that I am acquainted with, recourse is often had to the court of the baron baillie. It might therefore be deemed an omission, were no notice to be taken of his powers, as exercised under the Jurisdiction Act.

A proprietor holding immediately of the crown, and having his lands either erected or confirmed by the king into a free barony (in liberam baroniam), is the only person, in strict law, denominated a baron. Before the 25th of March 1748, the powers of his jurisdiction were extensive, comprehending all the causes betwixt himself and his tenants or vassals,

fals, together with questions of debt and other civil actions, within the barony. In criminal matters, his jurisdiction extended to all crimes, those of the first magnitude alone being excepted.

The jurisdiction of the baron court, as limited by act of parliament passed in 20th Geo. II. comprehends very little; extending to the recovery of the baron's rents from his tenants and of feu duties from his vassals, and to performance of mill and other services. In these and other cases, where the baron is personally concerned, he must proceed through the medium of a baillie or deputy. He judges in disputes betwixt tenants, about boundaries (marches) and other little matters of police, within the barony, when the baron is no party; the baron baillie court is also competent, in causes not exceeding forty shillings sterling. His criminal jurisdiction still extends to the smaller class of offences within the barony, punishable with a fine not exceeding twenty shillings, which may be recovered by poinding, and in default, a month's imprisonment. Yet in this last instance, his procedure is so clogged with such strict regulations, dictated by the jealousy of the legislature for the liberty of the subject, that they are now held to amount to an absolute prohibition.

In those cases, however, where the baron has a right of fairs and markets, he can, by himself or his baillie, exercise the summary jurisdiction necessary for repressing disturbances, determining disputes between dealers, and otherways maintaining peace and good order on these public occasions.

The name of justice of the peace is descriptive of the office, with which this magistrate was invested, at the original institution; and his powers were enlarged by various Scotch statutes, by the articles of the union and latterly by an act in 1795, which shall be taken particular notice of.

In

In judicial matters, justices of the peace are competent to take cognizance of many points of police, all breaches of the peace and offences against the public order of society, to execute the laws with regard to the highways, and those against vagrants and other disorderly persons. The game laws and those enacted relative to close time in the rivers are also under their jurisdiction. Until the year 1795, their civil powers in a strict sense extended only to servants wages; and this seems to have originated from the spirit of their office as guardians of the public peace.

By the late act formerly alluded to, entitled the small debt act, justices are authorized to determine in a summary manner, with regard to actions for debts or obligations, not exceeding L.40 Scots (or L.3. 6. 8. Sterling). This statute, investing the justices with enlarged civil jurisdiction, is no doubt intended to correct the bad effects, which a spirit of litigation before the inferior courts has produced in the country; because in the most trifling disputes, by the forms of these courts, a reasonable dispatch cannot be administered. When the full benefit of this institution is properly understood, it is to be hoped that the authority of this tribunal will be extended to actions for L.5 or farther; which will save an immense sum to the country. This law approaches in its summary nature to the decision by jury; and may be a mean of reviving in the minds of many, the wish that such trial would in all cases be extended to this part of the united kingdom. That this salutary law may be executed with every advantage and accommodation to the inhabitants, this and other counties are divided into a variety of districts, at each of which, monthly courts are regularly established; where two or more of the justices in the district sit in judgment by rotation.

Although

Although one justice can order suspected persons to be searched, or brought before himself or any other, for examination, and can imprison delinquents, in order to stand trial; yet in matters properly civil, two justices are necessary to give effect to a decree. This form also holds, with respect to the excise laws and their cognizance of offences against the revenue, to which, by the treaty of union and subsequent British statutes, they are declared competent.

There are quarterly sessions or meetings of the whole justices of the county at the head town, which have power to review by appeal, the decisions of the special meetings occurring in the different districts.

The commission of justices flowing immediately from the sovereign is not annexed to any particular valuation; and it is renewed, according as a decrease in the number requires.

The proper management of estates depending in a great measure on the regular administration of justice: The proprietor is, for the most part, a justice of the peace, if he be a commoner; and although his authority extends to all parts of the county for which he holds his commission, his immediate attention is generally limited by the district where he resides.

The baron baillie is annexed to the estate over which he is appointed, and his jurisdiction circumscribed by its limits: But the sheriff is a provincial judge. In every county there is one, deputed by the crown with a salary corresponding to the extent of the county and the multiplicity of business. Besides the depute sheriff, who must be an advocate of three years standing, there are two substitutes in the county of Perth, appointed by the depute, one at the county town, another at Dunblane, each with a salary of £.50 paid now by the Exchequer, but paid formerly by the depute

depute out of the salary allowed to him. If we consider the education necessary to qualify a person to act as substitute, the rank he ought to hold in the county, the variety of business that comes before him and the respect that he ought to sustain as an officer of the crown, his salary is by far too small—smaller indeed than the income of the officers of his own court, of the officers of excise and even of messengers at arms.

Before the celebrated act, dissolving the heritable jurisdictions, the office of sheriff was vested in the persons of the earls or greater barons. These, disdaining every pursuit as inglorious, except the profession of arms, deputed persons of an inferior rank, to act for them in the administration of justice, within the district, which was heritably annexed to their families. And so uniform did this deputation take place, that a doubt arose, unjustly, whether these heritable sheriffs or lords of regality, could hold courts in their own persons.

By the act abovementioned, a reasonable indemnification was granted to the heritable sheriffs, and their power of appointing deputies was abolished. The king, coming in their place, grants this deputation to a person regularly bred to the law, which he holds *ad vitam aut culpam*, being ordained to reside within his peculiar county four months every year.

The powers of the sheriff were formerly, and still are, of a very complicated nature, extending to civil, criminal, and ministerial jurisdiction.

The first extends to all actions for debt, to those upon personal contract or obligation, to poindings off the ground, mails and duties, removings, ejections, spulzies, freighting of boundaries (marches), and such others; to brieves issuing from the chancery, for service of heirs, tutory, terce, division,

division, &c.; as also to adjudications upon renunciation of the apparent heir. By a recent act he is very properly interposed as a check upon ordinary poindings for debt or otherways, no sale thereon proceeding without his warrant; so that oppression or irregularity comes almost immediately under his cognizance.

His criminal jurisdiction is understood to extend to all crimes, treason excepted; even to the four pleas of the crown, murder, rape, robbery, wilful fire-raising; but as to these, his jurisdiction has fallen into disuetude, it being more common and a more solemn procedure, since the regular establishment of circuits, that the sheriff return crimes of the first magnitude to the justiciary court, for trial, at the same time communicating to the crown officers the precognition or evidence taken by him in the first instance. In offences against the police of the county or breaches of the peace, the sheriff likewise interposes; and in these cases his jurisdiction is cumulative with the justices. He is the most ostensible also for apprehending fugitives, rebels, and other notorious criminals, and has the power to call, if necessary, the *posse comitatus* to his assistance.

In his ministerial capacity, the sheriff did formerly, when printing was unknown, publish the laws or acts of parliament for the general information of the lieges. Sheriffs return juries to the courts of justiciary and exchequer, execute exchequer writs, levy the escheats of rebels, the blanch, feu, and other casualties of superiority payable to the crown. They strike the fiars for the county, which ascertain the price of the preceeding crop for a rule to settle the value of the different kinds of grain in doubtful cases. They execute the laws which regulate exportation and importation; and since the union, the writs for electing members of parliament are

directed to and executed by them, whose duty also it is to return to the crown office the names of those elected.

While the powers of the heritable sheriffs remained, the meetings and terms of these courts were arbitrary; at present the sheriff courts are regulated as to their session-time, by the practice of the supreme civil court; although the sheriff still may hold courts at any period of the year, as he finds it expedient, and generally sits once or twice a week, as the pressure of business renders it necessary, during the vacations of the court of session.

The court of the steward or steward referred chiefly to the territorial revenues of the crown; and my only reason for taking any notice of it here, is on account of the stewartries of Monteath and Strathearn, two large districts of this county. The two great stewartries of Kirkcudbright, of Orkney and Zetland, each of which sends a member to the British parliament, still retain their ancient designation, and are in every respect the same as a shire. The less extensive stewartries, such as these within this county, were lands belonging in property to the king, whether by forfeiture or otherways, over which he appointed a magistrate, called a steward, who was invested with jurisdiction similar to a lord of regality. It is probable that the name given to this magistrate arose from the resemblance of his office to that of the great steward of Scotland, who had not only the administration of the crown revenues and the superintendence of the household, but according to some historians, the guardianship of the kingdom, in the absence of the sovereign. From this circumstance the royal house of Stewart were furnished, before they came to the throne; and the office has never been revived since they were advanced to the sovereignty.—Lands devolving to the crown were not always erected into stewartries.

ries. Unless they had regality powers formerly, the sovereign made them bailliarics, with a civil and criminal jurisdiction, equal to that of the sheriff.

Lords of regality had a power of appointing bailies or deputies, whose civil jurisdiction was in all respects equal to the sheriffs, and their criminal superior, extending to all pleas, treason excepted. Regalities were strictly territorial, being a jurisdiction annexed to lands held immediately of the crown; and the proprietors, although not ennobled, were dignified with the title of Lords of regality, to denote the high or regal jurisdiction with which they were invested.

In the county of Perth there are two commissary courts, for the respective dioceses of Dunblane and Dunkeld. This court originated in the early ages of Christianity, from the confidence reposed in the integrity and abilities of the clergy. After the conversion of the Roman emperors, this voluntary jurisdiction, especially in religious matters, obtained at length the imperial sanction; and the bishops were accordingly entrusted with the administration of legacies for pious uses, with the privilege of proving and confirming testaments, and appointing administrators for the moveable estates of those who died intestate. They assumed the sole jurisdiction in questions of divorce, adultery and bastardy, the restitution of tochers, and some others. This extensive jurisdiction diverted their attention so much from the exercise of their clerical function, that the bishops appointed vicars or commissaries with a delegated authority. From hence arose the bishop's or commissary courts. Besides the diocesan commissaries, a few others were established by statute in places distant from the court of the diocese; and a new supreme commissary court, on the decline of episcopacy in Scotland, was established by Queen Mary at Edinburgh, which consisted of

four advocates. Their decrees in consistorial matters are subject to the review of the court of session.

The powers of the commissary courts, whether supreme or subordinate, in civil matters do not exceed forty pounds Scots, (or L. 3. 6. 8. Sterling,) unless parties consent to their jurisdiction. Any deeds bearing a clause of registration, and protests upon bills may be registered in their books; and they are competent to authenticate tutorial and curatorial inventories.

The management of estates, especially of the great ones, was uniformly committed in former times to the factor or chamberlain; but agriculture has become so much the amusement of the country gentlemen, since the middle of this century, that many of the proprietors, besides the general superintendence of their estates, have a farm in their own possession, which they manage by an overseer and servants on livery meal. Since this happy isle became completely civilized and all disputes are determined by courts of justice, the profession of predatory war and an idle roving life, has given place to reading, to observation, to the improvement of the mind, and the embellishment of the country. The military art is chosen as a distinct profession and is much honoured, as it ought to be. Many of our improvements in agriculture are suggested by the gentlemen of the army, in consequence of their remarks on the practice of other countries. The gentlemen of the law, during the recess of their courts of judicature, turn much of their attention to the cultivation of their estates; and their habits of application to the former study quicken their ardour in pursuit of the latter.

If the property be extensive, besides an overseer on the landlord's farm, there is generally a factor or steward, and sometimes two, appointed to manage the more distant parts
of

of the estate. In these cases, unless the landlord have a turn for business, he is apt to lose sight of the detail of his own affairs; and if he be indolent, he has a good apology for neglecting his interest, because he pays another person for taking that charge off his hand. The prosperity of the estate and the comfort of the tenants, depend very much on the disposition of the factor, whose business it is to collect the rents, to pay public burdens, to redress grievances and settle disputes between neighbouring farmers, to ascertain the rent of new leases, to exact the various stipulations binding on the tenants, to superintend the improvements which are going on, and to see that the contracts between landlord and tenant are properly fulfilled. The baron baillie attends the factor once a year to take cognizance of the matters which are amenable to his jurisdiction.

The boundaries of estates are marked according to the nature of the country. In the vallies of the Highlands, different properties are separated either by substantial stone-walls without mortar (provincially *dry stone dykes*), or by a river, or a brook, or a range of rocks, or some other natural limit. The lower hills too are sometimes dissected by these walls; but more generally by bounding stones, fixed in the ground and set up singly; in other instances, if the stones be small, they are piled in heaps. The higher mountains are frequently divided in a similar manner, especially when different proprietors occupy the same side; but when they occupy different sides of the same ridge or general line of mountain, as commonly happens between parallel glens, their properties are determined as *wind and water divides*, which means the line of partition on the top of the mountain between the windward and lee-side, or as it is still more nicely marked by the tendency of rain-water, after it falls upon the ground.

In

In the southern districts of the county, the bounds are fixed in the same judicious manner, where hills or other barren ground intervenes; but where the land is arable on the boundaries of different estates, if quarries are contiguous, proprietors for the most part build a good stone-wall; if no quarry be near, they make a fence of hedge and ditch, with a belt of planting, generally on both sides; and if the ground be wet, the bounding fence is an open ditch, of a proper width to prevent the depredations of cattle. All these artificial fences are constructed and maintained at the mutual expence of coterminous heritors; and the law is so favourable to the improvement of the country, that any proprietor can compel his neighbour, not being a life-renter, to join in making a sufficient fence on the boundary which divides their property.

SECT. II. *Tenures.*

MODERN estates, in this country, and indeed in the most of Scotland, consist of superiorities or baronial rights, reserved under the name of feu duties; or of the gross possession of landed property, which is either held in fee simple, called a freehold, or in feu from a superior.

A great proportion of this county is freehold. Many of the small proprietors hold of a subject superior. When a great baron in the feudal times had occasion to borrow money, he had recourse to wadsetts, or feued off a part of his property at a quit-rent, which was greater or less, according to the amount of the premium that was paid in hand. The wadsetts are paid up; but the feus, being irredeemable, remain.

CHAP. III.

BUILDINGS.

SECT. I. *Houses of Proprietors.*

AS a topographical description of the county will be given at some length in the Appendix, in which mention will be made of the principal houses belonging to the proprietors in this shire, the reader is referred to that part of the work for information upon this branch of enquiry. And although the plan laid down for conducting these Reports, has directed that the geographical description of the county, and the houses of the proprietors, should be inserted in different chapters, yet as they conspire to produce the same pleasing sensations in a traveller, are under his review at the same time, and are mutually ornamental to each other, I have treated of them under the same article.

SECT. II. *Farm Houses and Offices; and Repairs.*

THE style of the farm houses and offices is greatly improved within these few years; and it is daily improving. In place of the mean hovels, in which their fathers lived, without light and without air, in the midst of foot and smoke, many of the farmers now live in houses, substantially built with stone and lime, having two floors and a covering of blue slate. Such of the houses as are at a distance from slate are covered with tiles or straw, and very few want glass windows. The houses for the most part correspond to the taste and wealth of the landlord and tenant. Where the
country

country is rich, the houses indicate the growing wealth of the people. Where the country is poor, the houses are ill constructed and inconvenient. Some extensive grazings may however be an exception, which have good steadings in wild and bleak situations.

In every part almost of this county, new steadings on an improved plan are built when the leases are renewed, which in a few years will render the whole tenantry more comfortable, and be very ornamental to the face of the country. The most industrious of the farmers have their stacks built upon stathels laid on pillars of stone or wood, to keep the under-sheaves dry, and save them from vermin. The offices are also improved, both in respect of execution and situation, forming generally a square behind the dwelling-house, with the dunghill or straw-yard in the center, and a foot-path around it. Yet I must add, with regret, that in several places, the houses of the ordinary tenantry are still mean; the farmer and his cattle lodge under the same roof, with separate entries and only a partition between them. The dung is laid before the door. If the straw be scarce, all his houses are thatched with fern or broom, which increases the meanness of their appearance. In some places, especially towards the Highlands, heath is used for thatch, which, however gloomy its aspect, is a far more durable covering than broom or fern, and in this respect not inferior to any straw.

A gentleman farmer in the Carse of Gowrie remarked, that where the situation of the ground would admit, it would be a great improvement in the construction of byres (cow-houses) and stables, to have them built upon arched floors; with holes in convenient places to put down the dung, and let the urine drop through the arch. This house must consist

lift of two floors, that above the arch, for the cattle, and that below it, for the dunghill. It ought also to be built upon a declivity, that the cattle may enter conveniently on the side opposite to that by which the dung will be carried away : and for this purpose, one side of the building must be supported on pillars, placed at such a distance from each other and of such a height, as to allow carts to come in below the cow-house to carry away the dung.

By these means there is no waste of dung with washing rains and bleaching winds. All its natural virtues are preserved entire. Being kept snug and warm, under cover, it ferments powerfully, which constitutes a great part of its excellence ; is thereby supposed to be at least one third more valuable, than when exposed to all the injuries of the weather ; and is laid on the land in that very state, which an intelligent farmer could wish : so that the original expence of making an arched floor is saved in a few years by the superior quality of the manure.

When a farmer enters to a new lease, the whole houses are in some cases valued by tradesmen, and the possessor is bound to leave them of equal value at the expiration of his contract, or to pay the balance in money. In other cases, the possessor receives them in a habitable condition from the landlord, and is simply bound to leave them habitable at his removal. With regard to casual repairs, or additional buildings, it is often stipulated, that the proprietor shall furnish the timber, and that the farmer shall be obliged, with this aid, to keep them in repair, and deliver them in proper condition at his removal.

SECT. III. *Villages, Cottages.*

BESIDES Perth the county-town and public works, there are in this shire upwards of seventy towns and villages, of which many have lately increased to an amazing degree, not only in the number of inhabitants, but in the neatness and taste of the buildings. Some are almost entirely new, particularly Callander, Comrie, Crieff, Muthil, Methven, Longforgan, and others.

After the peace in 1763, five villages were built at one time in this county by the trustees appointed under government for managing the estates forfeited in 1745, which had been annexed to the crown. In these villages they planted such soldiers as belonged to the country and had merited attention by their services in the war. Fourteen families were set down near Callander, each possessing a house, barn and cow-house, covered with blue slate, and three acres of ground at a price no higher than a quit-rent.

New villages are building, where there never were any before. Allowing therefore that there is a decrease of population on the farms, the increased population of the towns by far overbalances that decrease. The produce of the soil is more abundant, and land is improved which yielded little or nothing before : and wherever you produce more food, you will find more people. No man will venture to assert, that a farm of fifty acres, in the possession of four tenants, who have each a horse in the plough, and their ground mixed in alternate ridges, provincially *run-rig*, will produce the quantity of subsistence, which the same farm can do in the hand of one man, who has both money and industry to cultivate the ground. With respect to population, where is the difference, whether the other three farmers live on the farm,

farm, or in an adjoining village? But with respect to industry, the difference is great; on the farm they were three fourths of the year idle; in the village, they are skilful artificers or useful labourers, and able to rear their families without begging their bread.

The population is not only increased, and the land rendered more productive, by the establishment of well regulated and industrious villages; but labourers are at hand, in time of need, and artificers of various denominations, all ready to be employed in ministering to the different wants as well as the improvement of the neighbourhood. Villages afford also a ready market for whatever a farmer has to sell, and supply him with manure to improve his possession.

At the first establishment of a village, it is impossible even for the most discerning to foresee what magnitude it may arrive at, in process of time. From this want of foresight arise many of the deformities and inconveniencies of some of our greater as well as smaller towns; even the capital of Scotland not excepted: narrow or crooked streets, crowded houses, steep pulls, marshy foundations, buildings placed where there ought to be none, the want of common sewers or of a convenient place to receive the filth of the town. To avoid these deformities and inconveniences, they ought to be provided against by the original plan. A square should be set off in the middle of the village for markets: A retired place, and also not very distant, allotted for holding dunghills or peat stacks; a proper foot-path left along the front of the houses, so that the street be not incumbered with any trumpery at the doors, nor children annoyed with carts passing through the streets; an open passage or lane leading to the gardens, between every two or three houses, which will prevent carrying dung through back-doors.

and contribute to the cleanliness of the houses and the safety of the adjacent buildings, in case of accidents by fire.

If any thing like neatness or elegance is studied, no barn or cowhouse or stable ought to front the street; and all the front-houses ought to be as uniform as possible with respect to size and covering.

When the proprietor understands his own interest and that of his people, he introduces manufactures suited to the place, begins on a small scale, encourages some of the most enterprising tradesmen, and directs them, not to speculate in airy projects or to indulge their taste and humour, but to avail themselves of their local advantages, and to turn their attention to what it is most their interest to pursue. Man is so ductile, and has such a versatility of genius, that he is enabled thereby to suit himself to his situation, to apply the force of his mind to whatever object he has in view, and bend himself into any form he inclines. By a successful example or two, the Genius of manufacture smiles on the place, and a spirit of industrious emulation pervades the whole people; the village is extended as far, and the manufacture carried that length, which the produce of the place can afford and prudence dictate: But the moment it is extended farther, if their commodities are bulky, other places can undersell them in the market, unless they have water-carriage.

In establishing a village, every proprietor of penetration will study the convenience of fuel and water; ground for gardens to raise pot-herbs, grass for cows in summer and a provision for winter-food. If stone, lime, and timber be convenient and cheap, so much the better; and above all, the food of man ought to be plentiful and near at hand. A few of the lots of rented land ought to be larger than the rest,

to enable the possessors to keep a horse to plough their own and their neighbours' acres, and to perform occasional carriages.

The landlord will find it necessary to be careful in discerning the characters of the settlers; and his premiums ought to be moderate, that the feu-duty may be higher; otherways the people will not only have no stock to enable them to begin business, but they run the risk of getting into debt and of ruining their circumstances, even before their houses are finished.

The increase of villages, in modern times, is owing to different causes; but chiefly to these two—the desire, which every man has, of being *independent*, or at least of having a property he can call his own; and to the *present* state of society in this country. This increase is, therefore, the complexion of the times; not the effect of any premeditated plan, unless it be the plan of providence.

In rude and tumultuous ages, mankind assembled in villages for mutual protection. They commonly crept for safety under the walls of a fortification, near the castle of a baron, or close by a religious establishment. This is the origin of almost all our ancient towns, great and small; which accounts for the awkwardness in many cases, of their situation. In the agricultural state, and when the law is effective, they spread themselves through the country on their different farms: and whenever the society is advanced to that stage, in which the commercial and manufacturing systems begin to be united to that of agriculture, the division of labour takes place; every man follows a distinct profession; his profession is useful to others, and theirs are useful to him; men assemble more than at any former period; and towns and villages necessarily increase in number and in size.

The

The towns take the lead in whatever branch is the greatest object of the times, owing to the largeness of their capital, to their establishment into corporations, to privileges granted by the favour of the sovereign, and to their being frequently situated near water-carriage. The villages in their vicinity follow their example, and become towns. The spirit of industry and of enterprize diffuseth itself. Remoter villages begin to be roused, begin to be industrious, and to encrease in like manner. All is in motion. No man is willing to be behind his neighbour in the desire of comfort, in the road of industry, or in the enjoyment of wealth and independence: like an apiary, the bustle of business engages the whole community, the buzz of industry is heard on every hand, where every bee is employed in collecting his share of honey to enrich the hive; and the laborious husbandman rears the plants from which they derive their food.

It is acknowledged, that a watchful eye ought to be kept over villages, no less than over other collections of men; and that the reins of government ought to be held by a steady hand. Vice is the child of example, no less than industry. The superior, who desires to promote the prosperity of his village and of the country around it, ought therefore to reserve some checks to himself, until at least the community arrive at that degree of intelligence, of integrity and power, which may enable it to secure its own prosperity and regulate its own internal police. Weeds will necessarily arise in a neglected field to injure and annoy the valuable part of the crop. But if the good of the whole be studied, merit only rewarded, and impartiality pervade the system of government, then mutual confidence betwixt the landlord and the villagers will take deep root; and industry, cherished by benevolence,

nevolence, will produce the happy fruits of prosperity, affluence and contentment.

Well regulated and thriving villages are become, to this nation, nurseries for seamen and soldiers. These may be less robust than the peasantry; but they are certainly more *hardy* than the deformed spawn and jail sweepings of great towns. It must be evident that from the insalubrity of crowded cities and the unhealthy habitations which fall to the lot of the lower classes, they never did, nor never can support even their own population, without fresh recruits from the country: whereas villages of moderate extent, have as good air and as good lodging, as the country around them.

The cottages of the poor are very mean in all places: but in this county the dwellings of the labourers and married servants are keeping pace with the houses of the farmers, being in a progressive state of improvement. When the farmer obtains a house of two floors for the accommodation of his own family, he commonly reserves the low house, in which he formerly lived, for his servants. When any of the servants happens to be married, they have not only a house, but generally a cow's grafs to afford milk to their families, a patch of land for potatoes and a small garden for pot-herbs.

CHAP. IV.

MODE OF OCCUPATION.

WITHOUT taking a retrospective view of the ancient state of farming in this part of the united kingdom, a stranger

ger to the historical situation of the country will scarcely give the credit that is due to the present race of proprietors and farmers, for the inviting appearance which many parts of it at this day exhibit. Yet while we are prone to censure ruder ages, for the grotesque figure of their dress, the licentiousness of their manners, their roving lives, their homely habitations and the wild uncultivated state of their lands, we ought to reflect, that according to their situation in life, they acted with sagacity equal to ourselves. No axiom is more clear, than that mankind are in all ages equally sagacious to discern and equally ardent to pursue their own interest; and that men placed in the same circumstances will act uniformly in the same manner.

With all our boasted improvements, if we were under the necessity of ploughing our land and of reaping our harvests, with our sword buckled on our thigh; if we had never seen clover or turnip cultivated; if the state were so unsettled and the government so feeble, that the law could not protect our cattle from depredation, our houses from plunder, our families from insult, or our persons from bloodshed, dire necessity would have compelled us to act just as our fathers did, and to be exactly such farmers as they were.

The parent of industry is indeed the desire of comfort; yet industry can never flourish, nor bear fruit, unless the hedge of the law be planted around it. Before man can bring this delicate plant to maturity, he must sit under his own fig-tree, with none to make him afraid. Without industry there can be no cultivation; but without protection there can be no industry.

The late Dr Robertson, who has thrown light on every subject, of which he treated, says, in his history of America, "that hardly any region of the earth furnishes man spontaneously

neously with what his wants require; in the mildest climates and most fertile soils, his own industry and foresight must be exerted in some degree to secure a regular supply of food." If labour and care be necessary in those fertile regions, to which he refers, how indispensable must they be in the sterile soil and inhospitable climate of North Britain!

In northern latitudes, population has been always so rapid and the bounty of nature so scanty, that the cultivation of the ground must have been very early attended to. We have no records of any era in which tillage was not requisite in this country; and the presumption is, that more land was under the plough in remote ages, than in the present times. One thing at least, on this point, is certain, that ground has been formerly cultivated, which is so high, the climate in that latitude now so forbidding and the region of the air so piercingly cold, that no grain we have, could at this day, arrive at any degree of maturity. It is indeed probable that the hills were more easily cleared of wood than the valleys, that they afforded less cover to wild beasts, and that the whole face of the ground, except the summits of the highest mountains, being one continued forest, the climate was more mild and the country warmer, than it shall ever be again, because it cannot be so much wooded.

The husbandry of the particular shire under review was in a most wretched condition, even so late as fifty years ago. The whole land was occupied by run-rig*, not only in the farms, but frequently in the estates.

I

The

* Not like the common fields in England or Scotland, (as some suppose) where no boundaries are marked between the different possessors but in alternate ridges, having a bank of waste land for the boundary between every two ridges; and to add to the evil, one farmer possessed this year, what his neighbour did possess the former. Not only farms,
but

The first deviation from run-rig was by dividing the farms into kavels* or kenches, by which every field of the same quality was split down into as many lots, as there were tenants in the farm. This was a real improvement, so far as it went; every farmer had his own lot in each field, to be managed according to the best of his judgment, during the continuance of his lease, reaping the full benefit of his industry, which by the run-rig-husbandry he could not enjoy, owing to the exchange of ridges every year. Kavels still exist in the Stormont, and in some other parts of the county, in a certain degree, and almost universally in village-lands. In the latter they are unavoidable; in the former they are regularly exploded, as the old leases fall.

The houses were formerly in clusters for the mutual protection of the inhabitants, even to the number in some cases of six or eight ploughs of land in one hamlet. The farms were all divided into outfield and infield, except in the neighbourhood of the larger towns, where the farmer found dung to purchase, which could soil all his land. I have seen outfield carse, within these twenty years in some of the best parts of Monteath; and I see by my notes, that the same practice was followed in the other districts of the county. Under this management, the land near the farm houses was cropped alternately with oats and barley: and sometimes two crops of oats or more, were taken successively from the same field. The whole dung was
laid

but in some instances, estates were divided in this manner, especially when a property fell into the hands of co-heirs.

* This name is significant of the manner in which these divisions were made. Either the tenants of the farm or a neutral person, marked off the several portions of land; and the possessors cast lots (or kavels in the Scottish dialect) for their particular share. Kench signifies a larger portion of land than a ridge.

laid on with the barley crop; and in some cases the farmers unroofed their houses and dug soil or turf from the best spots of their grass fields, to increase the quantity of their manure. The infield being dunged every second year, and in constant tillage, became exceedingly foul. In some places a crop of pease was introduced betwixt the oats and barley; and in the best soils, especially in the clay land, a crop of beans with some pease intermixed; which was deemed an improved rotation in the old school.

Previous to the year 1735, even the fertile soil in the Carse of Gowrie was astonishingly unproductive, in comparison of its present state. The land was overrun in many places with rushes or disfigured with pools of water, at that time the usual haunt of lapwings; and the whole people subject to the ague. The outfield was cultivated as long as it produced three or four bolls from the acre. The infield was generally cropt in four divisions, wheat, barley, oats, pease and beans. About this period some gentlemen and farmers in that district diffused a spirit of improvement among all ranks in their neighbourhood; and the rushes, the lapwings and ague have now totally disappeared.

Towards the moorland parts of the county and in many places of the Lowlands, the outfields lying farthest from the townships, were tithed or dunged by confining the cattle in folds, over night, during summer and autumn, upon that particular portion of the farm, generally a ninth part of the whole, which was to be ploughed next spring. In some parts of Strathearn, Strathallan, and other places, the outfields were watered. Three crops of oats, and sometimes more were taken from these outfields successively, in the same manner as from the infields, until the land was exhausted to such a degree, that during the two first years of

its being in pasture, it carried very scanty crops of grass: and if the field had any declination, the finest particles of the soil were washed away in the rainy season, for want of a sward. Lint was generally sown in the best part of the outfields, especially after water.

By the regulations of old leases, the tenants were restricted not to *eff-crop* the infield (i. e. not to take two successive crops of oats), nor to fourth crop the outfield till *baugh-ley* (i. e. ley tithed or watered at six years old). And in very old leases or contracts, the tenants were simply bound to *turds* and *twurds*, which implies the regulation abovementioned. A deviation from this mode of cropping uniformly subjected the out-going tenant to damages, at the instance of the incoming-one, before the sheriff-court.

The old system of outfield and infield still prevails in many parts of the county, especially towards the north and west which are adjacent to the Grampians, and along the Ochill and Seedlaw hills. Although most proprietors may have within these 20 years, and some even before that period, inserted in their leases better regulations of husbandry; yet, owing to various causes, these have been very little enforced. In many cases, the leases have been written by persons better acquainted with law and accounts than with rural economy; by which means blunders are often inserted, and articles of importance are inaccurately expressed; so that in most actions betwixt proprietor and tenant relative to deviations from the articles of a lease, either the latter is found to be bound by no regulations, or the damages awarded to the former are very inadequate to the loss sustained. A remedy for this grievance shall be pointed out, when the means of improving the country are taken notice of; at present I must assert, that no axiom in mathematics seems to be
more

more evident, than, That no estate can possibly be improved, let the regulations in leases be ever so good and the restrictions ever so well detailed, unless the landlord shall either superintend his own property, or his factor be acquainted with husbandry and submit to the arduous task of directing agricultural improvements.

SECT. I. *Size of Farms. Character of Farmers.*

WITHOUT taking notice of diminutive possessions, which are called *Pendicles*, because they are small portions of the land allotted by a farmer to cottagers, labourers and servants, and therefore appendages of the farm, the extent of what may be properly called farms, is from 30 to 500 acres*.

These

* That the land should be better cultivated in large than in small farms can only arise from the oppressing of the latter class of citizens and placing them in a dependent situation on the former; but I will risk the assertion in saying, that if the landlords in every part of the kingdom, where small farms existed half a century ago, had still continued them in the same state or at most confined them to fifty acres of land, the increase of his wealth would have been much greater than it now is. *Samuel Fieldenouje, Old Garendish Street.*

If a farm is enlarged, it should be as well or better managed than when in small farms, or the end is not answered. In all the enlarged farms I know, there are more people employed than when they were smaller, and more produce raised, except when turned to grazing, which is no loss to the public, because fat meat is to be had, and if too much, some of the grazing farms will be turned to cultivation. Things will always find their own level. *Mr Butler of Chillingham.*

Many arguments may be used on both sides of this question; and when men of understanding and experience, who were known by the Board of Agriculture to have such professional knowledge, as to be solicited to revise the first copy of this Report, have taken opposite sides, it is vain to expect a determination of the question in dispute, by reasoning alone. Nothing will settle the matter but experience. No arguments

These may be considered as the extremes, where the land is arable. The general average of farms under a regular system of husbandry is from 100 to 300 acres.

In the Highlands and some parts of the low country, the farms were in former times so crowded with inhabitants, that the holdings were extremely small. It was very common to see four farmers, such as they were, with their four families and some cottagers, occupying one plough-gate of land. Half a plough was considered as a distinguished holding, and a whole plough as a very rare thing. The country was thus crowded with inhabitants; which state of population still remains unchanged in some districts. This to a stranger, who considers not the cause, may appear to have been both absurd in itself, and to derogate from the good sense of the proprietors: but under the feudal system, every baron valued himself, and was valued by the state, not so much by the largeness of his rental, as by the number of followers he could bring into the field. The farms were divided and subdivided to make room for a greater number of soldiers, and the whole country frittered down to the atoms, in which the farms in many places still appear at this day. *A horse's-foot*
(i. e.

guments will bring men to one mind, except matter of fact. The effect of small farms, (I mean horse-gangs of land, or the fourth of a plough) have been long seen in this county and much reprobated by every man, who wished his country to prosper. The effects of farms of 400 or 500 acres have not become so visible, because they have been adopted only of late, and still are rare. These are the extremes, and perhaps both are injurious to the general prosperity of the country. Without being dogmatical or pretending to be wiser than either of these gentlemen, my own opinion is, that farms of a middle size, neither very large nor very small, are most beneficial to the public good: and I have many reasons to support that opinion. But this question can only be determined with certainty, by consequences. *The Author.*

(i. e. the sixteenth part of a plough) is the designation of a species of holding known in remote parts of the country. Upon the decline of that system, the wealthier or more industrious tenant in many cases got the whole farm, with the burden of some small portions of arable land and grass, deducted under the name of pendicles, to which the poorer tenants were obliged to resort. And such in many instances was their attachment to the place of their nativity or to their chief, that those among them, who had not stock sufficient even for a croft, rather than emigrate, chose to become cottagers with only a house and garden; and thus became the servants and labourers upon the farm. This attachment is wearing off; and the people are pouring down in numbers every season to the adjacent villages and towns in quest of labour and of bread. Several proprietors of humanity wish them to remain and allow them conveniencies in their own country. But why do they not set off villages in proper situations, settle them in these, and show them the road to industry, by establishing among them the woollen or other manufactories?

Where the country is best improved, every vestige of the feudal holdings is there abolished; and the tenants are wealthy and intelligent. In the Carle of Gowrie, in the lower parts of Strathearn, along the Tay from Perth to Dunkeld, and on the banks of the Isla, especially about Meikle, some of the farms contain more than 400 acres of Scotch measure*, and a few amount to 500 all arable land.

On the skirts of moors and hills, it is not uncommon to have

* In every part of this Report Scotch measure is meant, when applied to land; which is about one fifth more than the English acre; or more accurately, a Scotch acre is 6084.44 square yards, and an English acre is 4840 square yards. See Preface.

have a large tract of grafs or pasture ground annexed to an arable farm. Possessions of this description are very frequent on the confines of the Ochills and Seedlaws, and in all the vallies of the Highlands which intersect the Grampians. The proportion of pasture and arable land varies always according to local circumstances: but in the most forbidding situations, at the very head of the glens, there is some arable ground, where the possessor has his house and garden and a little grain. The farms however, in these mountainous parts of the country, are more frequently reckoned by miles than by acres; and the stocks are in proportion to their extent. Formerly they were depastured by mixed stocks, partly black cattle, partly a small breed of hill-horses and partly sheep. At present the sheep stock prevails. From Dalnacardoch, the most northerly farm in the braes of Athol to Dalwhinnie, the nearest to it in Inverness shire, the distance is 13 statute miles. Of late a habitation has reared its head half way. At the head of Strathardle, Glenshee, Rannoch, Gleniyon and other places, the distances from the nearest farms or grazings of the adjacent countries are much the same, and in some instances still greater. These remote grazings used to be occupied in different lots during the summer-months, by the tenants of the particular estates to which they belonged. In which case they removed all their cattle to the several lots that fell to their share, where they lived in temporary huts with their whole families, until the grafs was eaten up, which was the practice of the Scythians and of other ancient nations in the pastoral state. When the hills were extensive, some farms had two or more lots in different places, to which the possessors moved in succession before their return to the homestead or winter-town. But by the present sheep system, the more distant grazings are disjoined

disjoined from the farms, to which they formerly belonged, and are let as distinct possessions.

It must occur to every person, who is at pains to make observations on the country, as he passes through it, that where the farms are large, the tenantry live better, clothe better and are more comfortable, in every respect, than where they are small. While at the same time even the small farmers themselves have greater abundance of the comforts of life, than they had some years ago. Yet it must be confessed, that there are instances, where they are crowded together in hamlets, their land in run-rig, no leases granted by the proprietor, or where the rents are augmented without increasing the means of paying an increase of rent, by improving and inclosing the land. It might be thought indelicate to mention the estates, where this wretchedness exists, and to hold them up as spectacles to the public view; yet surely it appears less cruel to have done so, than to be the cause of misery, at the very thought of which humanity recoils and sympathy doth shudder. It is not on thrones alone that tyrants are to be found. A benevolent man appears in his own likeness, in any sphere of life; and a hard unfeeling heart, whether found in the higher, middling, or lower ranks of society, is the curse of those within the reach of its baneful influence.

In a county so extensive as this, where there is a great diversity of soil and even of climate; where there is a difference in the manners, in the wealth, and even in the language of the people, in different districts; where the turn of thinking both of proprietors and possessors of land are almost opposite, it is by no means surprising that the farmers should be in very different circumstances and have very different habits of life. While some are in the deplorable situation

lately alluded to, other farmers in many parts of the country, have great merit and are entitled to great respect. They are distinguished for their spirit, their industry, their enterprise; the liberality of their sentiments, the enlargement of their views and their genius for improvement. To say that they are well educated and know what is passing in the world, is saying less than the truth. They have got loose from the trammels of prejudice, and boldly launch forth into the field of experiment in the line of their profession.

Many favourable circumstances however must conspire to ensure the improvement of a country. The ardour and intelligence of the farmers alone will not accomplish that end. Proprietors of the soil must lend their aid. The ideas of both must be enlarged; they must go on hand in hand, before their country can be enriched or beautified. The ardour of a tenant is deadened by the ignorance or oppression of a landlord; and all the patriotism and intelligence of a landlord are rendered useless by the stupidity and obstinacy of a tenant. They must unite their efforts; they must have an ambition—a pride to distinguish themselves in their different spheres; to follow and if possible to show examples. The proprietor ought to grant a lease, descriptive of the liberality of his sentiments; the execution of the plan depends on the farmer's activity. The farmer ought also to have funds suitable to the extent of his farm: His industry must be unremitting and his attention equal to the various operations he superintends. The genius of the government must be mild; the spirit of the laws favourable; and the interpretation of these laws must be a shield to his person, to his property, and to every thing he holds dear. Such, and many more are the advantages, which the farmers of this country enjoy. Of these advantages many of the farmers in the

the shire of Perth avail themselves: and whatever their fathers were, they are worthy of all the favourable circumstances they possess. What an astonishing change has taken place even in the memory of man! About half a century ago, the country was uninclotcd, the fields uncultivated and the farmers spiritless and poor. The want of industry produced a want of convenience. Then the farmer went on foot to market; now he rides well dressed and mounted: formerly he ate his food off his knee, and it consisted of meal, vegetables and milk; now his table is covered, his knife and fork are laid down before him to dine on meat: his father lay on a straw or chaff-bed, without curtains; he sleeps comfortably on feathers with his curtains drawn snugly around him. Servants and labourers have advanced in the same proportion, in their desire and enjoyment of the comforts of life. Since they are more industrious than their fathers, why should they not be more comfortable? And while they are inferior to no other class of men in their regard for things sacred, in the decency of their deportment, in their practice of the social virtues, in loyalty to their sovereign, submission to the laws and their love of order, long may they enjoy the well earned fruits of their industry! Long may they be the pride of their country and the terror of its foes! * †

SECT. II. *Rent.*

THE rent of all kinds of soil has increased, and is for the most part doubled, within these thirty years. This increase is occasioned in the grain countries by the improved system

K 2

of

* The pure pleasure that these noble sentiments give to the reader is the most acceptable tribute, that can be offered to the author of them. *William Fox.*

† To this I beg leave to say Amen. *William Dunn of Gillingham*

of husbandry, and by the use of lime and marle judiciously applied, together with the increased extent of the farms, the rise of markets and the additional population of the towns. In the grass countries, the rents have risen by the introduction of sheep and superior knowledge in the management of stock. In all places, where the land has been inclosed, the rise of rent has been owing, in a great measure, to the progressive benefit of that species of improvement and the increasing wealth of the country.

I met only with one instance (in Strathearn during my Survey in 1793), where land would let no higher inclosed than open. In some cases, where the rotation is close * and the land rich, where the bottom is wet and herding † unnecessary, all that the farmer desires is an open drain to carry off the water and ascertain his boundary. Hedges and hedge-rows would prevent the free circulation of air in harvest and gather vermin at all seasons: even stone-walls would occupy part of the ground, without carrying away the water ‡.

The average of rent, on the best soils, is from twenty to thirty shillings an acre; and on some land, in high cultivation and near the market, forty shillings. The average of light land is from ten to twenty shillings, according to its local advantages; and some is even so low as five shillings, especially on old leases, when a proper allowance is made for the pasture annexed to the farm. Moors and sheep-walks are more frequently rented by the *sum* §, than by the acre.

A horse

* Admitting few changes. † Tending cattle.

‡ Unless when stones are procured in clearing the land, the expence of inclosing will not be repaid but where one third of the farm is pastured in rotation; the expence of rearing hedges by protecting with piling is so great. *Sir William Murray.*

§ A term denoting the pasture of a full grown cow.

A horse is accounted two founs; in some places four sheep, and in other places, five are estimated at one foun; and young cattle according to their age. The grais of a foun, in hilly ground, is valued at an average from 5s. to 7s. according to its quality. Much centure hath been bestowed on this mode* of ascertaining the value of pasture or grais-land in the Highlands: but in mountainous districts, where the ground has never been measured, and probably never shall, where one mountain is extremely different from another in the quality and quantity of its pasture, and even great diversity, in different regions of the same mountain, it is not easy to conceive a better method of ascertaining the value of pasture than by the number of cattle it could maintain. Whoever proposes to explode any old custom, ought to substitute a better in its place.

All rents have been augmented; but where the land is not inclosed and improvement has made little progress, the rents have been fluctuating, except on sheep-walks. They have been more steady, where these causes do not affect them; and the probability is, that the rents will continue to rise, in proportion as the proprietors go on to inclose, the tenants to improve, and the prices of grain and of meat to increase, which at present (1797) are beyond any thing ever known in this part of the world. If, however, manufactures do not continue to flourish, the price of meat and other necessaries of life must fall; in which case both grais-lands and others will become less valuable.

Mr Marshall, in his report of the Highland districts of this county, p. 26, says, "That the rate of rent varies much on different estates. The smaller estates may have been raised to something near their rental value: but the larger, I believe,

* In some Surveys of Highland districts made by strangers.

lieve, remain at rents much below the value of their respective soils; even when the disadvantages of situation and climate are taken into the estimate. Nevertheless it appears equally evident, that while the present state of things remains; while the holdings remain so small, so inconvenient, so exposed and so uncertain as to possession, as they are at present, estates in general may be said to be at rack rent. No man could wish to see the occupiers of lands in a lower state than are at present the smaller tenants of the Highlands: indeed, were their holdings free, they could not, through their means, enjoy the common comforts of life equally with the labourers of other districts*.

“Formerly the rents of lands were paid in kind; as grain, poultry, &c.; and still what are called victual or rents in grain are paid; but money rents are becoming yearly more prevalent.”

Mr Donaldson, in his report of the Case of Cowrie, p. 9, 10, says on this subject, “That a considerable proportion of the lands there, having been let previous to the year 1776, before the ideas of improvement rose so high, are yet rented only at from twenty to thirty shillings the Scotch acre, and generally on leases of nineteen years, and the lifetime of the tenant after the expiry of that period.

“The leases now commonly granted are of endurance nineteen years. The commencement takes place in some cases at the term of Whitsunday as to the houses and garden, and to the arable land after ingathering the crop; and in others, at the term of Martinmas to the whole premises.

“The

* It appears that Mr Marshall is of Mr Bailly's opinion, in opposition to that of Mr Fieldhouse. See p. 65 of this Report with respect to the enlargement of farms affecting the prosperity of the tenantry and the increase of rent. *Non natum inter vos tantas componere lites, Virg.*

“ The rent stipulated is one half boll of wheat, one half boll of barley, and about twenty five shillings of money, for each acre. The grain is paid about the beginning of February, and the money rent at Whitsunday thereafter. When the whole rent is paid in money, the one half is paid at Whitsunday after reaping the crop, and the other half at Martinmas thereafter.

“ In the higher parts of the country the rent is generally paid in money, and runs from fourteen to fifteen shillings the acre for uninclosed land. When the lands are inclosed and subdivided with stone-fences, the rent may be about twenty five shillings the acre.

“ The average rent of the arable land, over the whole district, which has been let within these ten years, may be about thirty shillings the acre, including the lands adjoining to the villages. The only service performed by the tenant is the carriage of a certain quantity of coals to the landlord's house yearly *.”

On most of the grain farms over all the county the rents used to be paid partly in money and partly in grain; but rents payable wholly in money are becoming more general.

In

* I find by the notes taken on the spot in Oct. 1795, that one of the most intelligent farming gentlemen in all the Carle of Gowrie gave the following account of the state of rents. “ That an estate was letting at that very time, for which thirty one shillings in money and three furlots of wheat and three furlots of barley were offered, by the acre; the rent of small farms is all in money and runs between forty and fifty shillings, where the land is good; but in the higher parts of the district, where the ground is of less value, the rent by the acre is from twenty five to thirty five shillings.”

The rapid rise of rents, owing to the exorbitant price of grain, is the only reason that can be assigned for the difference in these statements. The difference is indeed considerable between 1793, when Mr Donaldson wrote, and 1795, when this Survey was taken.

In the Highlands, where the rents were mostly made by the sale of cattle and the produce of the dairy, they were payable for the most part in money.

There is no doubt that money rents are more easily conveyed and more expeditiously told over to the proprietor, and that he is thereby completely relieved from the drudgery of being a broker or dealer in grain; yet I have a reluctance in agreeing to the unqualified eulogiums which have been bestowed upon rents in money, or in pronouncing that, in grain countries, they are most proper. The value of money is so fluctuating, that what was a good rent at the commencement of a lease, may be a very inadequate rent before its expiration; especially if the lease be long. But the greatest public evil, which may eventually attend rents payable wholly in money, is, that this puts it out of the power of the landholders to prevent a monopoly of all the grain, and raising the prices to any pitch that the avarice of forestallers may incline; whereas, were proprietors of arable estates to have granaries of their own, they could in a great measure, regulate the pulse of the market and be a check upon monopoly.

In most contracts between landlord and tenant, the latter is bound to pay public burdens; by which is understood statute labour or a composition in money, carriages necessary at the repairs or building of churches and manfes, the land-tax, minister's and schoolmaster's stipend, grinding the vic-tual at a certain mill and the payment of a certain malture. Some of these services are accounted by the tenants to be grievous burdens: and the injury which they do to the cultivation of the country shall be pointed out under *Obstacles to improvement*.

The method of augmenting rents, with least inconvenience

ence to the tenant, and with equal advantage to the landlord, is by making the rise *progressive*. If the rotation be in *fixes*, the tenant may be ordained to pay a certain increase of rent on the seventh crop; after he has gone over all his ground, and has had time to dress it to his own mind; some more on the thirteenth crop, and so on progressively, at the close of every rotation, to the end of the lease. If the rotation be in *sevens* or *eights*, the same rule may be adopted, corresponding to every seventh or eighth year of the lease.

There is not only a want of judgment, but a degree of cruelty discovered in laying on a heavy rent at the very commencement of a lease, unless the farm be in high cultivation. This conduct defeats its own end, by depriving the tenant at once of the only means of either improving his farm or of paying his rent, without distress.

The yearly rent of the whole county, it is impossible to ascertain with any degree of accuracy, without having had access to the rental of every proprietor, which was not to be expected; and to have guessed at the amount, by random, would only have a tendency to mislead. The valued rent of the county is L. 332,412 : 3 : 4 Scots.

SECT. III. *Tithes.*

THERE have been no tithes in kind collected in Scotland since the reformation; except in some trifling instances, such as fish in a few towns upon the coast, or near rivers, and other things of the same nature; which may be considered as gratuities, sanctioned by long usage, rather than tithes*.

L **Many**

* In this Report, the payment of tithes is not noticed as an obstacle to improvement. *Quere.* Is the county of Perth tithe-free, or does the

Many of the ministers of the church of Scotland have a certain proportion of their stipend paid in grain, from the produce of their respective parishes, and the remainder in money. The stipend of some parishes in the corn-countries is all paid in grain; in the grass-countries, it is generally money.

Every Scotchman knows that the livings of the ministers in North Britain are fixed by the supreme court of this country, acting as a court of teinds or tithes; and that their livings are augmented from time to time, according to the circumstances of the country and the diminished value of money.

The inconveniencies attending this mode of providing for the ministers of religion are chiefly two, one affecting the landed interest and another affecting the ministers themselves.

1. Some of the proprietors had ascertained the teinds payable out of certain estates, at a very early period, by a valuation of the rents, when very low; beyond which valuation these teinds cannot rise, according to the present rule of procedure. Other proprietors having neglected to fix or value their teinds, must pay stipend according to the present rent: whereby it frequently happens, that the latter pay triple and perhaps thrice triple the stipend that the former pay, in proportion to their present rent. In many cases, stipends do thus affect the lands of different proprietors in the same parish very unequally and capriciously.

2. If all the teinds in a parish happen to have been valued at a very early period, when the rents, especially of grass lands were very low; the teinds as fixed by that valuation,

author think tithes no impediment to the improvement of poor waste lands. *Name unknown.*—*Ans.* Payment of tithe *in kind* is certainly an obstacle to improvement; but this county, and all Scotland besides, is tithe-free.

on, are in some cases, now, entirely exhausted; and notwithstanding, that the rents of such parishes may rise in the same proportion with other lands in the same country, no addition can be made to the living, because there are no vacant tithes. The minister perhaps of the next parish may obtain an augmentation, although the real rent of his parish be no better than that of the neighbouring one, because his tithes have not been valued at all, or even valued at a later period. Instances of this are frequent in Scotland; and many more will occur in a few years. Sometime hence many of the livings will be stationary.

In a variety of cases it is a loss either to the heritors or minister of a parish, that the court of tithes have no specific rules to regulate their procedure in determining the amount of stipends. They act merely as a court of discretion in this respect: and that discretion may happen to be different at different times.

The vexatious method of collecting tithes in South Britain is unknown in this country*, and these unseemly disputes never felt, betwixt a minister and his parishioners, which are so injurious in some instances to the interest of religion, so great a bar to the operations of harvest and the general improvement of the country.

It is not my intention to enter largely upon this subject: Tithes however do not seem to deserve the reproach cast u-

L 2

pon

* Although the ministers of the established church of Scotland never drew any tithes in kind, as expressed in the text; yet some of the great proprietors, who had most interest at court, got grants of the tithes in certain districts, which they collected with all the unfeeling rigour, formerly practised by the Popish clergy. In the tumultuous reign of Charles I. disputes ran so high in this respect, between these titulars of the tithes and the country, that they were finally commuted at that period.

pon them in some of the reports, which have come to my hands. They may require to be put under such regulations as are suited to the present state of the country, where they exist, and thereby cease to obstruct its improvement in any sensible degree. Yet they certainly existed before any government now known in the world, and before any local property in soil was established under the sanction of laws. They are as old as the days of Abraham, and seem at that time to be perfectly understood, as founded on the law of nature and of gratitude: but the most ancient and the most sacred rights are liable to abuse. The inconvenience attending the collection of tithes in kind might be removed, or at least alleviated, if they were converted; and this conversion fixed at certain periods, perhaps every fiftieth year. By some regulation of this nature, the tenantry would feel an ease, and the church would partake, at proper intervals, of the progressive prosperity of the country*.

SECT IV. *Poor-rates.*

THERE is no such thing as poor-rates in this country, in the same sense, in which it is understood on the south side of the Tweed. The poor are generally supported by a voluntary charity collected from the parishioners every sabbath, together with the interest of sums bequeathed by pious persons for their use; some petty fines for breaches of decorum, certain dues for the proclamation of banns, the use of the mort-cloth (the pall) and other casualties. This fund is managed by the minister and elders, under the controul of the heritors of each parish†.

When

* In a commercial country like Britain 25 years are enough.

Sir William Murray.

† Wherever poor's rates have been introduced, the amount of them has rapidly increased and debauchery flourished. *Idem.*

When the provision arising from these articles is inadequate to the support of the poor, the heritors are convened by the minister. The number of poor is laid before them, together with the amount of the funds applicable to their maintenance. The heritors ordain an assessment on the parish, in aid of the ordinary fund, equal to what is necessary, one half to be paid by themselves, and the other by the tenants, in terms of law. This assessment is apportioned, on the different estates within the parish, according to their respective valuations. If the heritors refuse or neglect to meet for this purpose, it is competent for the minister and elders to obtain a sentence before the judge ordinary of the bounds against heritors and tenants, for a sum adequate to the maintenance of the poor, including the aid that may arise from the ordinary funds. But in justice to the heritors in this part of the kingdom, I never heard of one instance, in which it was necessary for the guardians of the poor to sue them before the sheriff in an action of this nature. So much to the contrary, that the heritors of most parishes in this neighbourhood, and I believe in many other parts of the county and of the kingdom in general, gave an unlimited commission in summer and autumn (1796) to their respective ministers to purchase meal for the poor and sell it out at a reduced price, until the produce of the next crop should come into the market; engaging to refund the balance, which in some cases must have been a considerable sum: Such is the confidence that subsists betwixt the parties; and such is the humanity of the affluent towards the poor. It is well known what a sacrifice of revenue in the article of Excise was made by the government on that occasion, in order to prevent the distillation of barley and to increase the quantity of meal.

SECT. V. *Leases.*

NOTHING can contribute more to the exertions of industry than a certainty of enjoying all its fruits, under the protection of law: and therefore it is vain to expect that a country can be improved and the value of property intrinsically meliorated, unless the proprietors of soil give leases, which are reasonably long and sufficiently binding, to their tenants. It is a source of reproach to those who are the cause of it, and of regret to every beholder who wishes well to his country, that in many places, especially towards the Highlands, the farmers either have no leases at all, holding their land only from year to year, or the leases they have are clogged with so many arbitrary covenants, capricious articles and irritant clauses, that they may be broke, whenever the landlord pleases. A gentleman of discernment and compassion said once on this subject, that these leases were like the ten commandments, which no mere man could keep unbroken. Before the country was civilized, it was perhaps requisite, in order to prevent illegal practices, to hold the people in that dependent state, which a precarious possession of their farm implies: but in the present situation of affairs, this practice is highly detrimental to the proprietors of land, to the farmers, and to the public: to the proprietors, because their estates can never arise to their true value, unless they are improved, and farmers will not improve them without leases; to the farmers, because it enervates their exertions, and sinks their spirits, by withholding the true stimulus of industry, a certainty of enjoying the fruit of their labour: and to the public, because the general produce is less than it might be, and thereby an injury is done to the commonwealth.

Where

Where leases have been granted in the Highlands of Perthshire, their duration is for the most part either nine, nineteen or twenty one years. There are instances in the Highlands of leases granted for one life and nineteen years thereafter. In the Carle of Gowrie, it appears from the passage already quoted from Mr Donaldson's Report in the year 1793, that almost all the leases granted before 1776 are of this tenor. On the estates of the Right Hon. Lord Perth, of Colonel Robertson of Struan and a few more, there are leases of forty one years' endurance; some of twenty one. In the neighbourhood of Tullyallan a few are 36 years: but nineteen years are the most frequent in all this county.

On all arable farms, where a considerable outlay must be made, 19 years is requisite, because even on the best lands there is only one year beyond three rotations. Where there is nothing to do but plough and sow, the farm being already in full cultivation, the space of two rotations is sufficient, especially if a third or half of the rent be paid in grain.

When the farm is to be turned to account by sheep or cattle-stock and no outlays on the land to take place on the part of the tenant, eight or nine years is a fair lease, the proprietor or in-coming tenant being particularly bound to take the sheep-stock off the outgoing tenant's hands by appreciation of arbiters.

In granting leases to tenants, proprietors generally bind them to a particular method of cropping the land, specifying a rotation, suited to the nature of the soil. A few of them restrict simply to have one third of the arable land in grass, during the three last years of the lease: others allow only one third in tillage during the whole continuance of the lease; which, in light land and in a bad climate, is a sensible rule, easy to be observed and conducive both to
the

the interest of the landlord and tenant ; because in this case it is impossible to exhaust the land.

All fences given sufficient at the farmer's entry, must be left, at his removal, in a fencible condition, and the buildings in a habitable condition ; otherways the removing tenant pays damages to the incoming one, according to the amount adjudged by the (bye-law or) byre-lawmen of the barony, who are sworn valuator's already described and to be met with in most of the estates of this county. The services stipulated in leases have been mentioned under a former article.

Leave is reserved to the proprietor for working quarries, mines and minerals, and all fossils of that kind under the ground, the tenant being allowed a compensation for the surface-damage he sustains. Sometimes liberty is reserved for planting trees, on the same condition ; and the tenant is bound not to cut trees, or injure woods with his cattle.

When the land is to be inclosed during the currency of a lease, the stipulation of a certain interest on the money to be laid out by the proprietor in inclosing and subdividing the farm, makes an article of the lease : the tenant is accordingly charged with $7\frac{1}{2}$ or 6 or 5 per cent. on the sum expended, in terms of the contract. In some cases, each of the coterminous farmers pays 5 per cent. for the bounding fence. In a few leases the tenant incloses the farm, in the manner to be directed by the proprietor, and is paid for his fences, according to their value, at his removal.

In the low country, where drains or ditches are the proper fences, the farmers are farther bound to have all their open drains cleaned out, once every year, before the end of August ; or in default of doing so, the landlords reserve a right of having it done, at the tenant's expence. This is a regulation

regulation in the Carse of Gowrie; and it ought to be universal in similar circumstances. Where the fences are made of stone, along the face of the Seedlaws and other high ground in the county, the proprietor becomes bound in the lease to lay out one half of the expence of repairing the fences; and at the same time reserves a power to himself to order these repairs as often as he judges necessary. The same regulation takes place in Sir William Murray's property with respect to houses and fences.

Whatever be the nature of the fences on a farm, no other method of keeping them in repair seems to be so effectual as that of having the expence laid equally on the landlord and tenant. If the landlord is bound to keep the fences in repair wholly at his own expence, they may, in some cases, be wantonly destroyed; and if the tenant is to execute the whole repairs at his expence, it is highly probable, that instances will occur of their being performed in a slovenly and insufficient manner. To remedy these evils, the expence ought to be mutual; but the work should be performed by the proprietor, who has a permanent interest in the soil.

In the Carse of Gowrie and other districts, the farmers are generally debarred from selling any fodder off the farm, hay and wheat-straw excepted; and are bound to reside on the farm. In some leases provision is made, that, in the event of the tenant becoming bankrupt, the possession shall not fall to the creditors; the lease is forfeited and reverts to the natural possession of the landlord. This clause, though reasonable, cannot but rarely be supported in law.

The entrance to farms in the Highlands is universally at the term of Whitsunday with respect to every thing, except the land under crop; and to that land, when the grain is reaped. The rent is payable per advance at the ensuing

Martinmas, which is rather too speedy a payment for the incoming tenant, were it not that he is expected to make his rent mostly by the grafs. Although the term of payment stipulated in their agreement be Martinmas, yet landlords of discretion, and indeed almost all landlords, indulge their tenants with a delay until the beginning of February, in order to give them the benefit of some aid from the women's spinning of flax during the winter months, and of any barley they may have annually to dispose of. Payment in this manner is called *fore-hand rent*, because it is made before the crop is either reaped or sown, to which it refers; and their receipts being conceived in these words secure to tenants a crop of the arable ground as usual, in similar circumstances, after the payment of the last rent and after their removal from the farm. In some cases, the same regulations take place in the low country; but upon arable farms, a different procedure is coming into use, and will soon be universal. The term of Martinmas is the entry to the whole premises; and the rent is due against the time the tenant has possessed the farm twelve months, and payable by equal halves at the Whitsunday and Martinmas thereafter.

SECT. VI. *Expence and Profit.*

THERE is such contrariety in stating the expence and profit of different farms, that one, who has no check, is at a loss which to choose as a model, and even hesitates in resolving to communicate them to the public. This hesitation does not arise from any suspicion of an intention to deceive; but there is such a difference of detail given by different farmers both on the Debtor and Creditor's side; there is such a difference between the cultivation they give their land, between their management in bringing it to produce its highest

est profit, and even in the sale of that produce, that scarcely any two farmers, upon soils every way similar and on farms of the very same extent, would return a statement of expence and profit, which corresponded. Actual farmers have great advantages over surveyors of another profession, not only in their account of this, but of many other articles in these reports, because they can, with more certainty, have recourse to the detail of their own farms, whereas we must have recourse to the information of others: and yet even their own procedure does not imply absolute certainty, because another may improve better or worse, may manage better or worse, and may make more or less profit, in circumstances perfectly similar.

There is before me a minute account, for a year, of one farm of 330 acres, of another of $169\frac{1}{2}$ acres, and of a third of $74\frac{1}{2}$ acres. Some articles are omitted in the first and others seem to be strained; in the second the soil is not uniform; the third seems to be liable to none of these objections.

One farmer states the accumulated expence of labouring every acre at L. 2 : 7. Sterling; another states that expence at L. 2 : 4. Sterling; a third states it at forty shillings per acre. I have copied the latter in the following detail, which he gives of his farm for the year 1794.

The professional abilities and success of the man, who drew up this statement, give me confidence in recommending it as a model to all farmers, who wish to keep their accounts with accuracy.

EXPENCE and PROFIT of a FARM of 74 Acres and a half in
Carfe of Gowrie*.

FARM Dr.

A.	R.	F.		£.	s.	d.
16	3	27	Wheat feed, 12 bolls at 22s.	-	13	4 0
13	0	12	Barley feed, 8½ bolls at 17s.	-	7	4 6
15	3	27	Oats do. 15½ bolls at 16s.	-	12	8 0
14	2	16	Hay feeds - - - -	-	11	7 0
11	0	0	Turnips } - - - -	-	4	2 0
3	0	0	Yams } - - - -	-		
Expence of labouring 74½ acres at						
40s. per acre - -				149	0 0	
Rent of do. at L. 3 per acre -				223	10 0	
74	2	2	Total expence,	420	15 6	
Amount of profit, after comparing						
outlays and returns -				310	6 2	
				£ 731	1 8	

FARM Cr.

16	3	27	Wheat, produce and sales			
			152½ bolls sold to M ^r Kenzie and Co.			
			at 27s 6d - - -	210	0 6	
			3 do. sown at 24s. - -	3	12 0	
			2 do. sold to W Drummond at do.	2	8 0	
			1½ do. sold to A. Chalmers at do.	1	10 0	
13	0	12	Barley, produce and sales			
			116½ bolls to M ^r Kenzie & Co. at 21s.	122	6 6	
			8 do. to A. Boutar at 25s.	10	0 0	
			10 do. sown, for which offered 25s.	12	10 0	
15	3	27	Oats, produce 248 bolls, milled, sown			
			and on hand, at 16s. per boll	198	8 0	
14	2	6	Hay estimated at 200 stons per acre,			
			say 2800 stons at 5d. -	58	6 8	
11	0	0	Turnips } at L. 8 per acre -	112	0 0	
3	0	0	Yams } - - - -			
74	2	2	Total produce,	£ 731	1 8	

In

* Few farmers are so candid as to state their account of sales, without which it is impossible to understand the profit or loss, or on what side the balance lies. I have therefore confined myself to that given above, which originally was not intended for being published.

In order to give a connected view of this subject, the statement of various sheep farms, which in my former Report was included under the article of sheep, is now introduced under this head. It ought to be carefully remarked that there is a rise of about 50 per cent. on mutton and wool, since the year 1793, when the following prices were taken. How long they may remain at their present value is uncertain.

BREEDING STOCK.

	FARM	Dr.	£.	s.	d.
To rent	-	-	140	0	0
Interest of the following stock	-	-	46	3	4 $\frac{1}{4}$
1,280 Milch ewes, at 12s.	£ 768				
120 Dry ewes at 8s.	48				
200 Year-olds at 7s. 6d.	75				
54 Rams, at 12s.	32 8s.				
Smearing { 252 Ewe lambs 40 Lamb tups 54 Rams } at 4d. each	-		5	15	4
A shepherd, his assistant, and sheep-shearing			22	8	0
Fox hunter	-	-	0	12	0
Expence			214	18	8 $\frac{1}{4}$
Profit			68	0	3 $\frac{1}{4}$
			£ 282	19	0

FARM Cr.

By 128 shots of lambs at 2s. each (21 to the score)	12	3	9 $\frac{1}{2}$
800 tops of ditto at 4s. (21 to ditto)	163	16	2 $\frac{1}{4}$
40 dry ewes at 8s. each	16	0	0
18 rams at 10s. each	9	0	0
100 black ewes at 5s. 6d. (21 to the score)	26	3	9 $\frac{1}{2}$
156 stone of white wool at 5s. per stone (21 stone to the score)	37	2	10 $\frac{1}{4}$
40 stone of coloured ditto at 4s.	7	12	4 $\frac{1}{2}$
50 pound of 64 lambs which died in winter	5	0	0
48 ditto of 60 gimmers ditto	6	0	0
Produce	£ 282	19	0

WEDDER

WEDDER STOCK.

FARM Dr.		£.	s.	d.
To rent	- - - -	140	0	0
Interest upon the following stock	-	42	3	10 $\frac{3}{4}$
550 one year old at 7s.	£ 192 10s.			
530 two years ditto 9s.	238 10			
518 three years ditto 11s.	284 18			
672 lambs, bought in at Lammas, to keep up the stock, at 4s. (21 to the score)	128 0			
<hr/>		<hr/>		
Smearing 672 one year old at 4d.	-	11	4	0
A shepherd, his assistant, and sheep-shearing	-	22	8	0
Fox hunter	- - - -	0	12	0
		<hr/>		
Expence		216	7	10 $\frac{1}{4}$
Profit		158	13	0 $\frac{3}{4}$
		<hr/>		
		£ 375	0	11 $\frac{1}{4}$

FARM Cr.		£.	s.	d.
By 510 three years old at 12s. (21 to the score)		291	8	6 $\frac{3}{4}$
82 stone smeared wool at 4s. (21 stone to ditto)	- - - -	15	12	4 $\frac{1}{2}$
156 stone white ditto at 7s.	- -	52	0	0
100 found of 122 lambs which died in winter	- - - -	10	0	0
30 found of 40 one year old, two year old, and three year old, ditto	-	6	0	0
		<hr/>		
Produce		£ 375	0	11 $\frac{1}{4}$

This being the hardiest of all sheep-stocks, and the next the most delicate; the one is calculated for stormy situations, the other for ground which is low and warm.

FLYING

IMPLEMENTS.

91

FLYING STOCK, SOLD OFF ANNUALLY.

FARM Dr.		£.	s.	d.
To rent	- - - - -	200	0	0
Interest of the following flock for 9 months	-	7	17	6
600 ewes at 7s.	- - - - -	210	0	0
A shepherd	- - - - -	11	4	0
		<hr/>		
Expences		429	1	6
Profit		104	14	11
		<hr/>		
		£ 533	16	5

FARM Cr.		£.	s.	d.
By 550 ewes and lambs, sold at Lammas, at 18s.		485	0	0
30 dry ewes at 12s.	- - - - -	18	0	0
15 found of 20 ewes which died in winter		2	5	0
75 stone of wool, at 8s. per stone (21 to the score)	- - - - -	28	11	5
		<hr/>		
Produce		£ 533	16	5

CHAP. V.

IMPLEMENTS.

ALL the implements of husbandry are constructed according to better models and made of better materials, than formerly. So late as 20 years ago, no plough was to be seen, but on a gentleman's farm in the low lands of this county, except that which is now called the old Scotch plough, drawn by four oxen and two horses, or by four horses and two oxen. In the Highlands the same kind of plough was universally used, drawn by four horses all yoked abreast.

Instead

Instead of carts with wheels moveable upon the axle; that clumsy machine, in which the wheels were fixed to the axle, described by the President of the Board and still to be met with in the northern counties, was very common in all the low lands of Perthshire. The wheels had no spokes or naves. They were composed of three sections of solid plank, fixed together and rounded like the bottom of a large cask; and the axle was fixed in the center, going through the middle section. The shafts had two pins that embraced the axle and made these awkward wheels tumble along; from which circumstance they were named tumblers. A timber mallet wrought by the hand was all they had for a roller to break the clods in the stiff land of the carses. Fanners were very rare, and threshing machines not known. In the Highlands, the people performed distant carriages of bulky commodities with hurdles, fixed on each side of the horse, by means of a hooked car-saddle, still remembered by the name of *currans*. Less bulky commodities were carried in hampers or baskets, made of young hazle, with a square mouth, and fixed on the horse's back with the same car-saddle. Near carriages, particularly the ingathering of their hay and corns, were executed with a sledge, which consisted of two shafts reaching from the collar on the horse's neck to the ground, with cross bars near the horse's hind-feet, for a bottom, and at least seven erect bars behind, for keeping on the load. This sledge succeeded the hurdle and evidently required some road, whereas the hurdle could be used wherever it was possible for a horse to walk. The name which this sledge has in the language of the Highlands shews that it was the *carrus* of the Gauls in Cæsar's time; and the English name *car* is borrowed evidently from the Latin. Upon this sledge or car the farmers in the High-

lands

lands carried out the dung in large baskets, diverging towards the mouth in the shape of an equilateral triangle, one side of the basket lying on the bottom or floor of the sledge; but where the road would not admit of the sledge, the dung was carried to the field in baskets with moveable bottoms, like a valve, fixed to the hooked car-sadle, which opened in the bottom by a pin and dropped the dung where it was necessary. On these sledges they carried home their peats in other baskets of a square form and of such capacity as to hold a horse's load; but where the road was so steep that the car could not be used, they adopted small baskets of the same form, fixed on the horse's sides to the hooked car-sadle. In many parts of the Highlands, these sledges are still employed for carrying grain and hay, as well as peats; especially where the roads are so rugged and uneven as to render the use of carts impracticable. However censurable this practice may appear to a stranger, yet in some situations it is unavoidable; and at first sight it would seem incredible, with what dispatch and safety the people perform their work, and also with fewer hands than carts or waggons would require. Sledges are indeed going out, and ought to be so, where the cross-roads in a country or the by-roads in a farm are passable by carts. But notwithstanding every improvement which the roads have undergone; the principal lines of communication having deservedly claimed the first attention of the public; this has hitherto left the roads in other situations, in such a state, especially where the country is rocky or hilly, that carts would be overturned every moment. Distant carriages in every part of this county, where the journey is on the king's highway, are universally performed by carts.

It is to be hoped, if the waggons used in the moor-lands

of Yorkshire could be introduced with advantage into the Highlands of Scotland, as Mr Marshall says they can, that the Board will favour the country with a drawing of one, accompanied with directions how to use it.

It was deemed unnecessary to give a long description or any drawing of these uncouth implements, as they are mostly exploded, and gradually giving way to modern improvements. They were only used through necessity, arising from the peculiar circumstances of the country, and must disappear, when that necessity is removed.

One improvement leads to another. No sooner were the roads attended to, than carts were introduced; and no sooner were lessons of husbandry learned by common farmers from the proprietors, of whom they held their possessions, or from reading and observing the practice of countries more highly cultivated than their own, than they were emulous to follow the examples set before them, both in the execution of their work and in the construction of the various implements they employed: And we begin to be astonished at this day, how the farmers, even about the middle of this century, could work with such homely utensils, in the way of their profession, or keep themselves alive by the modes of farming practised in the old school.

Every implement of farming, used almost over the whole county, is now formed after the most approved models known in Britain; in the construction of which, such a quantity of iron is annually consumed, as would have been thought incredible by the grandfathers of the present farmers. In some sequestered corners, especially where the tenants are poor, the landlords oppressive or the soil difficult to be reclaimed, the dawn of improvement is only beginning to appear; but these forlorn spots bear no proportion to the happier districts

districts of the county, where cultivation is cherished by the benignity of the landlord and the industry of the tenantry, and is ascending to its meridian altitude.

The plough, used by many of the most knowing farmers, is that with a chain and curved mold-board generally of cast iron. Some very intelligent farmers, about the east bridge of Earn, reject the chain, but strengthen the beam with two lateral bars of iron, from the muzzle back to the great stilt or handle of the plough.

In Monteath some of the best farmers make use of an improved small Scotch plough, in preference to that with the cast iron mold-board invented by Mr Small at Ford, both on account of its lightness, and because it does not throw the furrow of clay-land so much on its back. In stony land, the round share is most in use; in land, which is free of stones, the feathered share is preferred, on account of the neatness of its furrow; and indeed in tough or new land, no other share will cut the roots of grass and weeds, or turn over the surface, with the same ease or equal beauty.

Subjoined is a model of the Scotch plough, recommended by the Board of Agriculture, which upon the whole seems to be the most generally useful, that has hitherto been invented.

These four kinds of ploughs are drawn each by two horses; but in a great part of the country to which this account refers, the old Scotch plough, drawn by three or four horses, is still in use: and in some places the barbarous custom is not exploded, of yoking four horses a breast, and of driving them by a man going backward. This practice appears very awkward and very much poaches the ground; yet they contend in their own defence, that the horses yoked in this manner act with greater power than otherways; that

the ground is in many places so full of large stones, as not to admit the long plough; that the driver, by having his eye at once on the horses and plough, can stop the draught more instantaneously and save the harness (graith) better than in any other position; that they are under the necessity of keeping small horses, adapted to their pasture in the moors, and require more of them to execute the labour of a plough-gate of land. It is to be hoped, however, that by the increasing cultivation of sown grasses, their food for horses and all other cattle will be more abundant; that a breed of larger horses will be employed; that two-horse ploughs will be made use of, and all arguments in defence of horses yoked abreast become unnecessary. The saving in point of harness and horses, besides having only one man in place of two, is so great and so evident, in favour of two horse ploughs, that they are fast gaining ground, in every district of the county, and it is hoped will soon be universal.

The harrows consist for the most part of four bars (bulls) with iron teeth. Some are made large enough to be a draught for two horses, which are distinguished by the name of Breakers. The teeth of these are formed like small coul-ters, having square tops, which are put upward into the bars, contrary to the common method of pushing the teeth downward. Into that part of the teeth which rises above the bar, there is, in each tooth, an oblong hole, into which a slit-nail is put; that keeps the teeth immoveable and prevents their being lost. This kind of harrow is extremely well calculated for breaking the large clods of a fallow or any coarse new land. The smaller harrows, with common teeth, are joined together by a coupling iron; and in some instances by a double coupling iron, introduced into Mon-teath and recommended by Lord Kames.

General

General Robertson of Lawers uses five bulls, having five teeth in each bull. The teeth do not follow one another in the same tract, which it has puzzled many farmers to prevent, and upon which various improvements have been suggested. His improvement, in this respect, is recommended by its simplicity. The harrows are four inches narrower before than behind; and are drawn by a muzzle fixed to a perpendicular pin. If any person wishes to make the distance between the harrow-teeth greater, he may encrease the difference between the breadth of the harrow before and its breadth behind. It may be made six or eight inches. If he wishes the ruts of the harrow teeth to be nearer one another, he may diminish the difference of the breadth between the fore and the hind part of his harrow. Harrows made even after the ordinary construction are prevented from having several teeth in the same rut, by their being yoked so as to move on the land somewhat diagonally.

In some places of the Carse of Gowrie and Stormont the harrows have what are called riders. The far-bar of the near harrow, (when more than one are yoked together) has three timber-pins fixed in the upper side, which are about six inches long and stand perpendicular. On these three pins is fixed a piece of wood which prevents the far-harrow from riding on the other. Wherever the double coupling iron is used, there is no need of these riders, because it makes all the harrows to rise and fall together, and keeps them from ever starting upon one another.

Rollers have become very common. Most of them are made of stone; others of solid wood; others built with frames and loaded with stones; and a few of cast iron. These made of cast iron are more easily turned, because they generally consist of two cylinders, so constructed, that one
moves

moves backward, while the other moves forward, at the end of the ridge; which is convenient in rolling red land. With other rollers, which are composed of one piece of timber or stone, the best way is to go round the whole field in the form of a spiral line, where it can be done; and then to continue always going forward without making any short turns. In rolling down grass seeds with barley or oats, this method is preferable, but grass lands may be rolled any way; although rolling ridge and ridge is more tedious even in these; and therefore rolling across the ridges is preferable.

The ease, with which a roller is drawn, depends on the length of its diameter, not of its axis; and therefore, although the stone-rollers are more durable than these made of wood, the latter may be made with fillies * and of a larger size than the former, which increases the diameter and renders them easier in the draught.

Threshing of corn by machinery has been practised in this county for near half a century; and these machines are now coming fast into use. Their construction is various, according to the ingenuity of the maker. They are driven sometimes by water, but in most cases by horses. They thresh more or less in proportion to the weight of water or the number of horses employed in driving them. Mr Paterfon of Castlehuntly, who introduced them into the Carse of Gowrie, has one, which is very uncommon, both for the quantity and excellence of its work. A farmer in Wester Lundie near Doune, of the name of Ferguson, is said to have invented a machine of this kind, very simple in its construction and very cheap; which are two considerations of importance to the common class of farmers. There are three erected already in the parish of Callander; and another about to be made

* Like small cart wheels.

made soon. The three which have been made, cost each about L. 20. At the moderate calculation of one shilling per boll, either of these machines will repay their own expence by thrashing the first 400 bolls.

Fanners for cleaning grain have been long used by the most industrious of the farmers, and are to be met with, not only in every corn-mill, but almost in every barn, where the farm is more adapted for tillage than pasture.

Kilns for drying grain are sometimes made with timber-ribs; which was the universal practice about half a century ago; many are made with brick-floors, but the cast-iron floors are daily gaining ground. The dispatch, the safety, and the saving of fuel, by these are a great object, and give them a decided superiority over the other two. The expence in the first construction depends on their size; but all this expence is soon recovered where much grain is to be dried. In drying on the iron floor, the victual must be constantly turned, otherways the meal acquires a red colour and a parched taste. The proprietors of mills ought to make one of this kind beside each mill for the convenience of their tenants. Two or three would suffice for a whole parish. This is the style in which these kilns are making their appearance in this district of the county.

Churns, cheese-presses and every other utensil of that nature are now made, in most places, after the most approved models.

Two horse carts have gone much into disuse; and are daily losing ground. Mr Mylne of Mylnfield, who had great experience in this and every other article of rural economy, said that a cart of 22 cubic feet, in capacity, is as easily drawn by one horse, as one of 28 or 30 feet by two horses; this being the common size of carts in the Carle of Gowrie.

That

That gentleman had a cart of a particular construction in his quarry of Kingoodie, which merits the attention of those, who have works of a similar nature, *fig. 1.* * This cart has a bend in the axle, which brings it within 14 inches of the ground, although moving on wheels more than 5 feet high. The case, with which it is drawn, loaded and unloaded, is superior to the common cart, in the proportion of 7 to 3. There is also in this quarry a cart for carrying very large stones, such as millstones, &c. which is drawn as easily upon wheels of 2 feet 2 inches in height, as upon wheels of a greater diameter. In this cart, the axle is only about 5 feet long; so that the wheels run under the body of the frame, which is flat and may be made of any breadth or length required.

At St Martins, Mr MacDonald has a very ingenious contrivance, to facilitate the unloading of his carts, when his men are to lay the load in different heaps. By means of this simple improvement, the box of the cart is held at different heights in unloading, the lime or dung is distributed into regular quantities, and the carter is greatly aided in the difficult operation of lifting up the loaded cart. It can only be used in what are called coup-carts, i. e. when the box is moveable on a frame; and the contents can be discharged, without lifting the shafts or rig-widdy: But no other kind of carts ought to be used.

On the forepart of the box and exactly in the middle, there is a thin piece of iron (*a*) *fig. 2.* fixed firmly with nails, which is about an inch and a half broad, between one and two eighths of an inch thick, and of the same length with the height of the box. In this thin piece of iron there are three or more oblong holes, of dimensions corresponding to the head of the rod after mentioned.

On

* See the plate.

On the first bar (*b*) or fore sheath, that keeps the shafts together, and exactly in the middle, there is an iron rod fixed with a staple (*c*). This rod is about 18 inches long and nearly an inch in circumference; but it may be made longer or shorter as found necessary; which necessity depends on the height and length of that part of the box which rests on the frame. The head or upper end of this rod is formed into the shape of a crescent, an inch wide, with its points upward, and of that thickness, which may easily find access into the corresponding niches of the iron plate, fixed to the fore part of the box. To prevent this rod from dangling about the cart, while it is not used, a small hook is fixed to one side of the front of the box, where it rests.

When the driver wishes to unload his cart, he heaves up the box a little, and puts the end of the rod into the uppermost niche, where the box rests till he make his first heap. He moves on to the place where he proposes to make his second heap, raises his box to a second niche, and so on, till he has divided the load into as many heaps as he has niches.

Although it is evident that two horses in separate carts will carry at least one third more, than when yoked together; yet such is the influence of custom, that double carts are very frequent, in some parts of the country. When the load cannot be separated, there is a necessity for yoking two or more horses in one carriage, but in carrying coals or lime or grain or any such articles, the loss of labour is considerable.

Perhaps some time hence, in the low country, where the toll roads are properly directed and almost horizontal, it may be thought more eligible to construct carriages with four wheels, like the frame of a waggon or of a gentleman's chaise, in which two horses, yoked abreast and having no

part of the load upon their backs, would certainly draw more than four horses in any carts of the ordinary construction. This improvement cannot however be adopted with equal success, where there are any pulls in the way; but to avoid these as much as possible is the study of every engineer who understands his business.

To bring single and double carts as much as possible under the public eye, and to evince the superior excellence of the former by the test of mathematical demonstration, we may observe, that whatever part of the load is before the center of gravity which is always in the axle, rests constantly on the horse yoked in the shafts*. Going down a hill, this burden must be considerably increased, especially if the load be high above the axle or the descent steep; and the additional burden is always in the proportion of these two causes united. But this is not all the evil. Unless the line of the draught of the foremost horse be exactly in the line (*edf*) from the hook of his collar to the middle line of the axle (which is scarcely possible), he will be pulling down the hind-horse's back, or in other words, will be giving him more weight to carry. But the traces are generally fixed about the pin of the shafts (*d*) *fig. 2*, which throws the line of the fore-horse's draught (*edg*) a considerable angle above the axle (equal to *fdg*); from which it is evident, to any person who attends to these circumstances, that, let the road be ever so level, in every double cart, the horse in the traces must either not draw at all, or must bring additional weight on the other horse; which weight is always in proportion to the force with which he draws, and the largeness of the angle (*fdg*) which the line of his draught (*eg*) makes with the line betwixt the hook of his collar and the axle of the

* See the plate, *fig. 2*.

the cart (*ef*). Besides, unless the driver be more careful than ordinary to keep the trace-horse to his duty, the other poor animal in the shafts has not only this great weight to carry, but all the load to draw. The angle (*fdg*) is increased considerably, when the trace-horse is of a lower size than the one in the shafts, which frequently happens.

It may be suggested to those who are fond of employing two-horse carts, that in order to adjust the traces of the fore-horse with as little injury as possible to the one behind; while the two horses are standing in their places, a small line or cord may be held, with one end at the center of the axle and the other at the hook of the collar of the trace-horse (*e*); mark exactly, how much this line is below the shafts at the place where you intend to fix the traces (*b*). Let an iron pin with an eye or rather a rod with a knee be fixed to the under side of the shafts, corresponding to this measure. By fixing the hook of the traces to this eye or knee (*b*), the draught of the two horses will *coincide*, being both from the center of the axle to the hooks of their respective collars. Unless this coincidence take place, the two horses will in a certain degree be working against one another.

In the long plough with four horses, the same reasoning holds and the same consequence follows (only substituting the muzzle of the plough for the axle of the cart), so far as the draught is concerned, if the traces of the fore-horses are fixed to any part of the harness of the pair behind. In general that inconvenience is prevented in the plough by using a long chain (provincially a foam), which connects the draught of the foremost pair, not with any part of the harness of those behind, but immediately with the muzzle of the plough; by which means the draught of the four horses *coincides*. It is singular that no person has hitherto thought

of avoiding this inconvenience in the mode of yoking a double horse cart, while it is frequently avoided in yoking the plough, although it be equally injudicious in both instances.

Even in a plough with two horses, unless the back-ropes are so adjusted, that the traces (provincially theats) are in a straight line from the hook of the collars (provincially hems) to the first timber behind (swingle tree), the better a horse draws, the more weight he brings on his own back, in addition to his draught. Skilful farmers indeed have said, in a few instances, that the weight of the furrow must, in some degree, rest on the horses necks, by means of the back-ropes. This may be a reason for the traces being straight, but not for their being bent upwards.

By the notes I took near Coupar of Angus, I see that some of the farmers in that country prefer mold boards *rounded* outward, not hollowed, which they say are more easily drawn. This seems to be the common mold board inverted. Future experience alone must determine how far this is an improvement. Convex mold boards would seem to increase the friction, and to be therefore drawn with more difficulty, than these which are concave.

The expence of all implements of husbandry is so various in different districts of this extensive county, according to their quality and the neatness of their construction, that it would be difficult and even superfluous to give a detail of the different prices. Persons well skilled in making them have found it their interest to open shops almost in every village; which is an evidence of the good sense of the farmers, and that the obstinacy of prejudice is giving way to the growing taste for improvement.

The average price of a cart properly constructed is from L. 8 to L. 9, and of ploughs with a chain and cast-iron mold

mold board, from L. 2 : 2 to L. 3. The common cart may be from L. 1 : 11 : 6 to L. 2. The price of a threshing mill has been already mentioned, others are much dearer.

Very few oxen are now used for draught, except in the carses or clay land, and even in these districts, much fewer than formerly. The farmers alledge, that in critical seasons the oxen are so slow, that they are under the necessity of preferring horses, for the sake of dispatch.

CHAP. IV.

INCLOSING, FENCES, GATES.

IT may be proper to begin this chapter by taking some notice of the attention which was shewn at an early period by the legislature of North Britain to the agricultural improvement of their country, so far as it appears from the statutes which were, for a series of years, enacted for that purpose. It is with pleasure, I take this opportunity of doing justice to the enlightened ideas of our ancestors, by referring to some of their laws relative to inclosing and planting, that the reader may see agriculture was not overlooked in Scotland, even amidst the clashing of swords and the din of armour. Nor is there any doubt that the surveyors in South Britain will also in their reports point out the dawn of rural cultivation, in their country.

By an act of the Scottish parliament in 1457, cap. 80, it is ordained that the king's freeholders, both spiritual and temporal, shall order their tenants to plant woods and trees and make hedges. in places convenient, under such a penalty as the lord or baron shall modify. The former acts for
encouraging

encouraging planting were enforced in all points by an act of parliament in 1534, cap. 10, with this addition, that every man spiritual and temporal, within the realm, having L. 100 (L. 8 : 6 : 8 Sterling) land of new extent, shall, where there are no woods or forests, plant wood and forest, and make hedges, in places most convenient, extending to three acres of land, and above or under, as his heritage is more or less, causing his tenants to plant one tree, for every merk-land; and inquisition is to be made yearly thereupon by every sheriff in his shire; the penalty of neglecting these enactments being fixed at ten pounds (16s. 8d. Sterling).

It appears that the legislature never lost sight of this business of improvement; for all these statutes were revived and ratified by parliament in 1661, cap. 41, in which it is ordained that every heritor, life-renter and wadsetter, worth L. 1000 (L. 86 : 6 : 8 Sterling) of yearly valued rent, shall inclose, for the space of ten years next ensuing, at least four acres of land yearly, and plant the same about with trees; and that all others shall plant more or less, in proportion to their respective rents. For their encouragement, these inclosed lands are declared free of all burdens and quartering of horse, for nineteen years after the date of the act.

By these statutes it was enacted that whoever cut down or brake a planted tree was to be fined in L. 20 (L. 1 : 13 : 4 Sterling) or compelled to work during six months to the person injured, having only meat and drink for his labour: and whoever brake down hedges or inclosures was fined L. 5 for every trespass, or compelled to work ten days without wages. The labours of the delinquent, in case of his insolvency, were made to repair the injury he had done; and the punishment, while it served the purpose of deterring offenders,

fenders, did not outrage the feelings of humanity; which is always a symptom of an enlightened jurisprudence.

These enactments of the Scottish legislature could not fail, from the precautions taken to enforce them, to have produced the desired effect of adorning and meliorating the country: and indeed it is evident from a variety of ancient statutes and other unequivocal proofs, that agriculture as well as commerce had made very considerable progress in Scotland at a very early period, more early perhaps than is generally supposed; and that her fields waved with rich harvests, while her cities resounded with the busy hum of men.

In a county so widely extended as that under review, where there is such a variety of soil in respect of value, where many of the proprietors and farmers have so little intercourse, that those, in one extremity of the county, scarcely know what these in the other are doing, not only the inclosing but every other article of rural economy may easily be supposed to be very different, in several provinces.

In the moor lands a great part of the land is open, especially from the higher verge of the green pasture to the summit of the mountains. Nature has marked this boundary, and where she has drawn the line betwixt the heath and green ground, there a fence is carried, parallel to the direction of the valley. This fence is more substantial and better formed in some cases; in others more rude and simple, according to the times, in which it was constructed and the encouragement, which the occupiers received. Because it ran across the head of every farm, it was called very properly the head-dyke. Above the head-dyke the young cattle, the hill-horses (and frequently all their horses), the sheep and the goats were kept in summer; the milch cows were fed below. Little attention was paid to boundaries
beyond

beyond the head-dyke. The mountains were almost common among the tenants of the same proprietor. Different properties were generally ascertained, as said already, by brooks, which ran down the face of the hills and by the course of the water to opposite sides, at their summit. The head-dyke was the first fence thought of in the Highlands, because the inhabitants had no other security at night, for preserving their corns and meadows, from the depredations of the hill-stock, during six months in the year. There was no part of the country destitute of this safe guard, beyond the memory of man. The head-dykes wear the most extreme features of old age, and even tradition itself is silent with respect to their origin. They seem to be coeval with the knowledge of agriculture in this country; and the probability is, that the mountainous districts of Scotland had their head-dykes, before a single inclosure was to be seen, defending a corn field, in the more fertile provinces of the low country.

From the bottom of the vallies, another fence was carried, on each side of the several farms, at right angles to the head-dyke, until they met. These lateral fences were more rare, and generally followed the course of some rivulet; nor were the latter equally necessary, because the milch cows were all day under the eye of the keeper and all night confined in folds, until the corns were reaped and gathered in.

Besides these, there was a kind of ring-fence round the outfields. Land of this description in the Highlands was patches of between 10 and 12 acres, less or more, in detached parts of the farm, interspersed among the pasture ground, generally the highest and most remote parts of the possession within the head-dyke, and such as were most easily subdued

by

by the plough. Each outfield consisted for the most part of as much land as the cattle of a plough-gate could manure (tathe) in a summer, by being confined upon it, over night, in folds. These ring-fences consisted partly of stones rudely piled upon one another, and partly of fods, as most convenient; and in many cases of alternate strata of both. They were made very simple, and often irregular, to humour the situation of the ground inclosed, being only intended to prevent the tended cattle from stepping into the corn-fields adjoining to their pasture, when they eluded the vigilance of the cow-herd: Yet they were so very common as to be seen almost in every place, and so very ancient that it is impossible to trace the æra in which they were built.

We meet with evident vestiges of ridges in the higher regions of the mountains, beyond all these fences, where the land has never been inclosed. These inhospitable spots never could have been turned up in the ordinary circumstances of the country. What dire necessity could have compelled men to plough such land? And how could grain come to maturity in such a climate? Either the first inhabitants of the country found the vallies so much infested with wild beasts, that they thought it safest to fix their residence on the mountains; and the country was so much wooded, that it was warmer than at present: Or during the successful campaigns of Agricola in this country, it is very likely, that the Caledonians were compelled to retreat from the more fertile to the more barren parts of Scotland. The inhabitants flocked to their fastnesses, where their enemies durst not follow them. The population was in this event, crowded beyond what the usual produce of the country in these places could support. The pressure of their situation urged them to have recourse to the soil of the mountains by a tem-

porary tillage, to prevent famine. What noble heroism, to run the risk of wanting subsistence, rather than to live in plenty, under the Romans, with the loss of liberty!

These remarks are applicable to the general state of the Highlands at a very early period: the features of all the mountainous parts of North Britain are in that respect much the same: and excepting in the vicinity of the mansions of great proprietors, things remained for several centuries, in this situation. Before the union, the trade of every man was war; and there was little leisure and no inclination to inclose or cultivate the ground. Within the period of half a century inclosing has made rapid progress in this country, especially during the last thirty years; and the ardor, with which this and every other species of cultivation is carried on, in our time, promises to be lasting and highly beneficial to all ranks of men.

In a country intersected with so many mountains, a great proportion of the surface must remain for ever uninclosed, because the produce of the soil will not repay the expence; and few men are disposed to throw away money, without some prospect of a return. If inclosing however shall be carried on, for another century, with the same spirit which has gone forth of late years, all the green ground, even in the high lands, will be inclosed; and in half a century in the low. It may be computed that taking the whole county at an average, three fifths of the arable land is open.

Where inclosures have been made judiciously, their extent is proportioned to the size of the farm, to the relative situation of the ground, and to the rotation of crops. By the size of a farm is meant one plough-gate; because it would be absurd to suppose, were one man to engross all the land in a parish, that the inclosures ought to be enlarged proportionally.

tionally: And by the relative situation of the ground is meant the convenience of water, the throwing of lands together, as far as possible, that can be laboured and sown at the same time, the intersection of bogs, the course of rivulets, the rising of swells and a variety of other circumstances, which ought to occasion the inclosures to be made unequal in size or in number; but if possible the number ought to correspond to the rotation. When the bounding fence is finished, the subdivisions even of the largest farms and in the most similar soils, seldom exceed thirty acres. In most cases, they are about twenty. In the Carse of Gowrie and in districts where there is need of draining and but little fall, they are even less. When there are no local circumstances, that counteract the regularity of the inclosures, they ought invariably to be regulated by the extent of the farm and the rotation of crops, suitable to the soil and climate. In a small farm they should be less; in a great farm larger. This secures a convenience with regard to the operations of ploughing and reaping, which cannot be obtained by any other mode of division.

The prices are extremely various, both of stone-walls and of the hedge and ditch. Stone-walls without mortar, or what are called double dykes, prevail, where the quarries are convenient or stones are found in the fields, or where the exposed situation and sterility of the soil render the growth of thorns precarious. Hedge and ditch prevail, where the land requires draining and the soil is of a good quality to rear the quicks. When stones are near and easily wrought, the lineal yard, four feet high, is, in most cases, quarried, led and built for 6d. but in many situations, when a double row of fods by way of coping is included, the long

rood of thirty six square yards * costs from L. 1 to L. 2 : 2 according to the difficulty of quarrying and leading ; and at all the intermediate prices, corresponding to the price of labour in the district and the convenience or inconvenience of the work.

A ditch of six feet wide at the surface and of depth sufficient to allow a proper slope, including thorns and paling, is executed in most places of this county at 13s. or 14s. the long rood ; but when the ground requires some pick-work, and the rafters and stakes are dear, it costs more. When the thorns and railing are furnished by the proprietor, a ditch of that width is charged 1½d. per yard. A ditch of four feet wide is wrought for 1d. per yard. In the upland, the ditch is sometimes faced with stone and the hedge placed behind, in which case the labourer charges 3d. for both : but all these prices vary according to local circumstances.

I met with one instance, in which the thorns of a fence of this kind were not set on the top of the fence, immediately behind the stone wall, which is the common practice, and where they are apt to fail, the first year, for want of nourishment, if the soil and season be dry ; they were planted at the lower extremity of the slope, formed by the earth thrown out of the ditch, where they found plenty of nourishment.

In planting hedges, attention ought to be paid to the nature of the soil, where they are to be placed, so that aquatics may be set in moist soils, and on dry soils plants that are
suitable,

* Six square yards is the short rood, thirty six do. is the long rood. If ells are mentioned, every ell is one inch more than a yard. The instrument, with which ells are measured, is called an Ell-wand, because it was made originally of a small rod or twig, provincially a *wand*. Thirty six square yards are to 36 yards square in the proportion of 36 to its square.

suitable. Alder, planted by the side of a river or stream, not only makes a speedy fence, but preserves the bank from being undermined by the current; it is continually putting forth new suckers from the roots, whereby the earth of the bank is matted and bound firmly together.

In marshy ground an immediate fence may be made by driving down stakes of green alder or willow which soon strike root and grow apace, provided care be taken that the bark be not stript off, when they are driven in. They ought to be planted obliquely and diagonally to one another, so as to have the appearance of chequer work, and bound with edders along the top, to prevent any sudden danger of their being loosened by cattle or high winds. They may be planted in layers as well as truncheons. The layers are planted about a foot and a half or even one foot deep, in holes prepared for them at proper distances, where the plants are to stand and their tops cut over about nine inches above the ground. The shoots of the layers being nearer the earth than those of the stakes will form the strongest fence in the end; and may be trained so thick and close and grow to such a height as to be both a shelter and a fence.

Besides the hedges formed with common hawthorn, which are very general in this county, there are some instances of a new kind of hedge, which merits attention. At Ardblair in the Stormont, the property of Doctor Joseph Robertson, the best of friends, there are hedges made of larch-trees, planted in the face of a ditch, instead of thorns. The same kind of hedge is at Beleid on the estate of Mr Campbell of Auchelader, in that neighbourhood: and Mr MacDonald of St Martins said he was about to try that fence. They are planted zig zag, or diagonally as thorns sometimes are. A hedge of this kind is said to be sooner fencible than
any

any other that thrives in a dry soil, admits of frequent pruning, and in a short time will be impenetrable for closeness and strength, by the branches interweaving with one another.

The late Archibald Stirling Esq. of Kier introduced upon his estate, the practice of planting a hedge in the face of the stone-wall, opposite to the surface of the field, in an opening of three or four inches square; which saved the expence of weeding and railing, and is in a thriving condition. In a few places there is what is called a Surrey-fence, and by some persons a snap-dyke, which consists of about thirty inches of a single stone wall, raised on the top of the ditch, behind the thorns, instead of stakes and rafters, to defend the hedge and ditch.

The most approved mode of pruning hedges is that described in the masterly survey of Mid Lothian, in which it is recommended by Mr George Robertson to trim the thorns in a regular slope from the bottom on both sides, ending in a very acute angle or point at the top. There are many examples of hedges trained after that manner, in this county.

About gentlemen's houses, the stone walls are for the most part substantially built and cast with lime; but in other places they frequently consist of dry stone, or of stones with common mortar. Persons who understand the building of dry stone-walls properly, find a bed for the larger stones, not by means of pinnings, which is the common way, but by resting them firmly upon one another; and afterwards they close up the interstices with pinnings to ornament the wall. No part of the weight lies on the smaller stones; they are only used to please the eye.

At Glendevon, on the property of Mr Rutherford of Kinghorn, about Blairgowrie, on the old estate of Ashintully,

fully, at Pitcur, and in a few other places, where the ground is high and the stones fit for the purpose, the fences are Galloway-dykes. When the stones are very large, they are in some cases built single from top to bottom; but more commonly about the half of the wall is made of such small stones as have a bed, and is built double. The upper part of the wall is made of single stones, built in the form of an arch, every stone with its thin edge downward, forming a wedge between the other two. The largest stones are always put in the tire, that is immediately above the double part; and every row decreases in size, towards the top of the wall. The upper courses of Galloway dykes ought to be made as open as possible, to afford least footing to sheep and to let them see through: And if the first course of single stones shall project a little over the double wall, so much the better. Of all dykes this is the most formidable to cattle. A double wall of twice the height will not turn sheep with equal certainty. Its tottering appearance, and seeing light through the stones deters them from any attempt to scale it, together with the want of footing on the top. These walls may be made of the coarsest stones; and when they are properly laid, having the center of gravity always resting on the stone below, they stand better than double walls, unless these are cemented with lime and have plenty of band stones.

With regard to fences built with lime it may be observed that, except where the stones waste with the weather, lime is more ornamental than useful in all stone-fences, if the dry stones be laid on their fair bed; because lime enables the workman to conceal not only a penury of stones, but also the not laying them on the bed they ought. Besides, nothing can at any moderate expence be contrived to prevent water getting down into a stone wall and thereby destroying the

the effects of the lime, by the expansion of the water, owing to the alternate action of frost and thaw. It must be confessed that since the building of stone-walls by the piece has become so common, it is difficult to get the dyke-builders to bed the stones fairly.

Even a common wall of five feet high may be rendered fencible against sheep. 1. By laying on the top a tire of flags set on edge, standing in a perpendicular position and of such a height and length, as to project over the wall 6 or 8 inches on both sides. The perfection of this fence consists in making the flags nearly triangular, placing one angle at the top. The number of flags may be much diminished, if they are scarce, by putting land stones between them, so as to keep them at six inches distance, which renders it impossible for the sheep to pitch upon them or find footing; and if this be done, there is less necessity for the flags to project over the wall. 2. When flags cannot be got, long stones of any form may be used for the same purpose, taking care always that they shall project over the wall, and that a coping of small field stones be piled above, tapering to a proper ridge. 3. Osiers are sometimes used for the same end, fixed into a turf-coping of double fods, and wrought together like wicker work, each in a circular form. This requires almost constant repair, and at best is only a temporary fence. If it be a faced fence, and the backing good earth, the osiers will grow, but small stakes of alder are more certain. 4. What may be preferable to the osiers is, that into the same double row of coping, short truncheons of any kind of timber be driven, leaning somewhat to the side of the wall on which the sheep are; and that their tops be bound with edders without any other filling.

In the Carse of Gowrie and in most of the flat land in other parts of the county, where the cultivation of grain is the principal object of the farmer, inclosing of land, except open drains to carry off the water, is not deemed an improvement. Hedges breed vermin; and although stones could be got, the wall would cover some of the surface, and the stagnant water would also remain. In such situations, open drains are undoubtedly the properest fences, because they serve the two purposes of fencing and draining.

Many of the stone-walls and hedges have rows of trees. Where shelter is the object, and the ground of little value, these belts of planting are in many cases forty feet, and sometimes as many yards, broad, being filled mostly with common firs: but where ornament alone is studied, they are often narrower and different kinds of trees are always intermixed. If a hedge be the fence, the trees ought to be at some distance from it, in order not to rob it of nourishment or air, nor to hurt it by dropping. Of all trees the ash is the most hurtful in hedge-rows, the oak and the laburnum the least hurtful.

All bleak countries ought to abound in these belts, because they change the temperature of the air, and by their shelter form a milder climate. As far as hedges are superior to stone-walls, in respect of warmth, so far are belts of trees, which keep the leaf in winter, superior to every thing else. They not only form a screen to protect the interior ground of the field, afford a place of refuge to cattle, both from the heat in summer and from the storm in winter, provide them a comfortable bed to lie on and some grass to feed upon, when every other place is covered with snow; but will withal be, in due time, a plentiful supply of wood for the various purposes of husbandry, in a country where

nature has denied that boon, and thereby make an ample return to the proprietor for all his expences. In most situations the belts around fields of arable ground ought to be narrower, and the trees of a kind that carries less foliage, than those around fields, which are to be always in pasture, because corn requires more air than grass; and if one day be lost in harvest by the stagnation of air, the whole crop may perish. When the rotation does not include some years of pasture, perhaps there ought to be no belts, except on the north side of the farm or in exposed situations.

My business led me many years ago to travel through some parts of the country and to remark the situation of the tenantry, who inhabited land that had not been inclosed, nor sheltered with belts of planting. Let one instance or two suffice in place of a hundred. The farmers were wretchedly poor. Want sat upon every brow, hunger was painted in every countenance, and neither their tattered cloaths nor their miserable cottages were a sufficient shelter from the nipping cold. Their crops were late and scanty, and their half-starved cattle, like themselves, stood exposed and shivering with every blast. That I may not be thought to speak at random, I quote the instance; and the doubting may make enquiry. The Quiggs, a barony belonging to the estate of Kier, immediately south of the bridge of Ardoch, on the road between Stirling and Crieff, having been in this situation, was inclosed and sheltered, in the manner alluded to, some years ago, by the fostering hand of the proprietor. The climate became milder apace, the soil more productive, and the people more comfortable and affluent: in so much that I say, on the best authority, there is scarcely a farmer at this day, in all that barony, who is not able to purchase his own farm.

In

In some parts of the Stormont and on the way from Coupar to Perth, besides many other parts of the county, the incalculable advantage and beauty of this species of improvement must strike every beholder, and must be highly pleasing to every man, who rejoices in the prosperity of his country. A farm on the estate of Balharry, near Alyth, which, about 20 years ago, being uninclosed, was let at L. 23; and yet the tenant did not thrive. He left the farm in arrears to his landlord and to the country. The same farm, after being dressed and inclosed, lets at present for L. 240 of a well paid rent: But the spirited improvements of Mr Smyth will fall to be taken notice of, with more propriety, under another article.

Every gentleman, whose estate is not already inclosed, will perhaps find his account in beginning with a survey and plan, distinguishing the different kinds of soil, marking the land fit for tillage, and that which is only fit for grass, and the plantations distinct from both. He shall thus have the whole under his review at once, and have leisure to examine, to digest and to amend his plan, both according to his own judgment, and to hear and weigh the remarks of the best improvers in his neighbourhood, who have distinguished themselves by their taste and their knowledge in rural affairs. This is the time to correct the general plan, rather than to undo any part after it is executed, which always implies weakness, precipitancy and unnecessary expence. The whole will be divided with propriety and precision, so as to render it most beautiful and most convenient; and every part shall be destined to its proper use. If a house is to be set down upon it, the whole may be made an ornament to the principal residence, by a judicious disposition of the plantations, hedges and farm-houses. Even the farms should

be divided in such a manner, that the dwelling of each tenant may be as central in his fields, as the situation of the ground will admit, to facilitate his carriages and attendance. The very steadings of the different farms ought to claim attention; and much judgment may be displayed in their construction and relative situation.

Forest trees are useful not only for warmth and ornament, but for a variety of different purposes; yet as they are found evidently to be injurious to corn and grass that is near them, they should rather be disposed of in plantations on such lands as are suitable to the nature of the different trees, where they can do no injury, and where the lands cannot be otherways occupied to such advantage.

Inclosing is of such advantage, that it is almost impossible to improve land without it. At any rate, it will never amount, while uninclosed, to its real value. Inclosing ascertains to every landlord his just property, and to every tenant his own farm; and thereby prevents an endless number of trespasses and injuries and depredations of neighbouring cattle: It dries up the bitter sources of ruinous litigations: It promotes harmony and peace: and besides many other advantages, it enables the industrious farmer to follow a regular rotation of cropping and to sow when and where he pleases.

Various methods have been adopted in defraying the expence of erecting inclosures in the first instance, and of preserving them in proper repair. In place of giving any detail of these, let it suffice to mention what appears to be the most equitable and effectual. If a farm is to be inclosed and subdivided at the commencement of a lease, the whole expence of making the fences ought to be laid out by the landlord, who has a permanent interest in the ground; and in
the

the gross sum of the rent, an equivalent may be charged for the interest of the money expended in inclosing. If on the other hand, a farm is to be inclosed, during the currency of a lease, the proprietor ought still to lay out the money, and a contract be made with the tenant to pay such an additional rent in name of interest, as may be agreed upon betwixt both parties. In the provision made for maintaining the fences in proper repair, the expence, as was said above, ought always to be mutual and equal on both sides, for very evident reasons, and these repairs executed by skilful labourers, when required by either party, and compleated to the satisfaction of the landlord. Few disputes take place about erecting fences, unless the agreement be very bungling; the great bone of contention is the keeping the fences in order; and it is presumed that by the provisions pointed out, much contention and many expensive law suits at the end of leases may be avoided.

There is a great variety of gates in the county of Perth, some consisting of two leaves, some of one: Some moving on the center, which gives the appearance of two gates, some moving on one end. Most of them opening only to one side, and others opening both ways, by means of two crooks and eyes at the foot of the back part: But these, which seemed to be best constructed, were on two estates in Strath-earn. The model* was lately brought into that country. The back of the gate itself (independent of the post on which it hangs) has a projection of three inches, in the timber on the fore-side, rising nine inches from the foot of the moveable part. On this projection rests the back end of the diagonal bar, which points upwards to the fore part of the gate and reaches about four feet and a half in that direction.

* See the figure, which ought to be placed here.

tion. This diagonal bar is of such a thickness, that every one of the horizontal bars pass through it, nicely mortised, except the lowest and the highest. About six or ten inches from the termination of the diagonal bar above, there is a perpendicular one fixed in the two outside ones above and below, and of such a thickness as to admit all the rest to pass through it, mortised as they are in the diagonal bar. The rest of the gate is made in the ordinary way and may be of any length. Some of them are made double, having more than one perpendicular bar : but these appear to be too complex and to have too many joints. It is only the single gate, which has been here described ; and any description can hardly be understood, unless the Board are pleased to accompany it with a drawing. Models of both the double and single kind may be seen now at Callander. The excellence of this gate is, that all the horizontal bars, except the highest and lowest, rest, not on the posts only, but likewise on the diagonal and perpendicular bars ; and that the diagonal bar itself rests on the projection of solid wood, at the foot of the back post : so that it is impossible the joints can start or the gate come asunder, until the timber rot ; or that the gate itself can fall forward, unless the pivot, on which it moves, or the pillar, on which it hangs, be faulty. It is far superior to any gate, whose diagonal bar is fixed only by nails to the horizontal ones.

CHAP. VII.

ARABLE LANDS.

SECT. I. *Tillage.*

IN a country, where the quality of the soil in different districts is so various, and the ploughmen are so different in respect of intelligence and experience, the tillage, which is always affected by these circumstances, must necessarily be of various degrees of excellence: and let the ploughman be ever so expert, if the land be infested with such obstructions as bushes or bogs or large stones, it is impossible that the work can be well performed.

In the lower parts of this county, where much of the ground has a gradual slope or is nearly in the plane of the horizon, and also in the bottom of some vallies of the Highlands, tillage is well understood and executed in a masterly manner. So attentive are the generality of the gentlemen and the most respectable farmers to this matter, that competitions are occasionally appointed in certain districts, among a number of ploughmen, and premiums are adjudged to those who excel. Every man knows that it is destruction for land to plough it wet. Stiff land is thereby battered more closely and rendered more cohesive, and loose land is the more overrun with weeds. Harrowing wet is equally detrimental; and shearing wet no better, unless the grain be black victual, or the straw remarkably strong. See *Agricultural Maxims*, which the reader may turn over to, before he reads what is said on the treatment of arable ground.

In

In several places, where the declivity of the land renders it necessary, and particularly in the neighbourhood of Balgowan, where the farmers seem to have imbibed the spirit of their landlord for improvement, a circumstance is attended to, relative to tillage, which is of more importance than is commonly supposed. When the fields hang so much, as to be accounted steep, the ridges ought neither to be drawn parallel to the bottom of the fields; nor at right angles, straight up and down; either of which would be inconvenient in the ploughing, and injurious to the soil. They ought to be drawn diagonally. The great point is to understand in what direction this diagonal slope of the ridges ought to run. In this respect Balgowan's tenants are perfectly correct; and it is my wish that their example were followed by all farmers, whose land has a great declivity, of which there is a considerable proportion not only in this, but in all hilly countries whatever. The form and direction of the ridges is contrived with such judgment, that the furrow (or as Lord Kames with more accuracy calls it, the furrow-slice) falls easily away from the mold board, as well in ascending as in descending the field, which is the principal secret. There can be no more than two diagonal lines in any four sided figure, which is generally the form of inclosures; and if you bring a sensible ploughman to each of the angles below, desiring him to look towards each of the opposite angles above, he will at once tell you, which of these diagonal directions is easiest for himself and his horses, and will accordingly fix on that line, by which the furrow *in ascending* will fall most readily into its place, having his right hand and the mold board of his plough with a side-aspect to the bottom of the field. Perhaps this may be made more plain by a description. Suppose the field to have a steep descent and a south-

ern aspect, the ridges are drawn from south west to north east ; which is the case in the instance alluded to. Suppose again the field to have a northern aspect, the ridges are drawn in the same direction, but with this difference in ploughing, that you *ascend* south west in the last case, whereas you *descend* south west in the first. If the field fronts the east, you ascend north west ; if the field fronts the west, you descend north west, i. e. invariably four points forward from the slope of the field, in going up the hill.

Whoever tries this method of ploughing very steep land, will find that one third less of power will suffice, than if the ridges were straight up and down, besides that there is less waste of soil in the time of rain, by the water running in the furrows : And what a great saving is that of an additional horse ! If, on the contrary, the ridges be made parallel to the bottom of the field, all the dexterity of man and the force of cattle, that could be applied, would be insufficient to turn every second furrow up against the hill.

The expedient universally employed, according to the old system, in ploughing fields of this kind, was, either to plough with a double mold-board, or if the mold-board were single, to plough only one furrow, in going twice the length of the ridge ; but most frequently the last. Both are bad husbandry. In the former method you lose none of your time indeed, but one half of your labour is lost by the latter. My principal objection holds equally against both. All the soil is year after year rolling downward, and in process of time the upper part of the field will be peeled to the bone and quite bare of soil, while a great bank is accumulating along the bottom, like a dunghill, composed of the richest land in the field : and withal the furrows are laid so completely on

R

their

their back that little benefit is derived from the manure, excepting it be laid on the surface the first year.

The depth, at which land ought to be tilled, depends entirely on the nature of the soil. Some soils on a gravel or sandy bottom are so thin, that if ploughed with a deep furrow, the productive earth is thereby buried so far below the surface, that no crop can be expected. This happens also, when the subsoil is a hard or a wet till. Other soils may be so deep and rich, that the more fresh mould, which is brought up and mixed with the former mould in action, so much the better. No crops are equal to those growing on virgin earth. The safest time, for trying experiments of ploughing deeper than ordinary, seems to be with a summer fallow. The influence of the atmosphere, the warmth of the sun, the alternate action of frost and rain and snow, together with the frequent stirring, meliorate the most inert soil. Even the stiffest till or the coldest clay imbibe new and better qualities by this operation. And in this way alone is it safe to bring up a little even of gravel or sand, especially before liming or marling, seeing it is wonderful how much their nature alters.

The breadth of ridges ought to be regulated by the nature of the soil. The former practice was, that in a wet field the ridges were made narrow, not broader perhaps than three paces, in order to increase the number of furrows and lay the land dry. If the soil was very wet and spouty, they were raised a little in the crown: But if the land has no subterraneous water, raised ridges are, on many accounts, to be avoided. A well cleaned furrow with a narrow ridge, even although nearly flat, will suffice, in more cases than we are aware of, to carry off the rain water, if there be a proper ditch at the end of the ridge, to receive it.

Practical

Practical farmers have now rejected the narrow ridges in wet soils, particularly those that do not absorb the rain; for it is obvious that in such cases nothing but declivity will carry off the water; and that can be best obtained by ridges moderately broad and properly raised; a number of furrows are also saved.

On a dry bottom, the ridges may be kept as flat as possible, in order to retain the moisture necessary for vegetation; and they may, with safety, be made four paces broad at least. The furrows in general produce less crop, than any other part of the ground: the fewer furrows the better, provided the land can bear it. If the field be dry, there is not only more produce, by fewer furrows, but the ridges are cloven by every ploughing, (a thing that cannot be done in raised ridges with deep furrows) which keeps them in an uniform level surface and greatly facilitates the labour of spring and harvest.

Persons, who are not accustomed to investigate the causes of what they daily see, are deterred from making their ridges nearly flat, by the water that stagnates in the stripes of grass and sprits, that lie between the ridges, which they have raised greatly in the middle: never considering that they are working against nature, because the more the ridges are rounded, the deeper are the furrows, till they become like ditches, and the more readily do clods fall down; so that they are, with their own hands, producing the very evil, which they wish to prevent. Whereas, were these stripes of flags and other trumpery torn up, were the furrows less deep and kept carefully cleaned and open, to allow a free passage to the water, the whole would flow to the open drain at the extremity of the field; and the higher the furrows are in respect of this drain, their relative height would

make the water flow the faster. Care should always be taken that the clods, which fall back into the furrows and dam the water, in such land, shall be removed with a spade. The slovenliness of men, in this particular circumstance, more frequently produces the stagnation complained of and all its baneful consequences, than either ridges moderately raised or any other cause.

These remarks appear satisfactory with regard to laying out such land into ridges in the first instance; but where land has been formed into high or crooked ridges, it is not so easy, to persuade men to bring back these to a level surface. The objection made by some farmers in the Carse of Gowrie is this: In the action of levelling ridges, that had been, time immemorial, raised high in the crown, much soil is brought up, which for ages had neither seen the sun nor smelled the air. This, like most other soils, which has been so long and so deep buried, is very unproductive at first, and blasts all their expectations. It is perfectly consonant to the process of nature that this should, in some measure, happen; and, as far as it has any weight, is an argument not only against levelling, but against straightening the ridges of such land. But was not every particle of that soil, which is so much reprobated, on the surface of the ground before the ridges were so raised by the hand of man? Was not this very soil, at that time, as good as any soil in the field? Nay, was it not much more fertile, before it was buried in the middle of the ridge, than the *new* soil, which the ploughman was digging up year after year, out of the sterile furrow, to assist in gradually raising his ridge higher? Every man must answer in the affirmative. If you therefore bring back your land nearly to the level, in which the hand of Nature left it, you will find the very soil, which was then

on

on the surface; the soil, which had been fertilized by the deciduous parts of plants, from the creation, until it came into cultivation; the soil, which Providence intended for the production of grain for the use of man. This soil has not surely lost its fertility, although that fertility has lain long dormant by its being covered up in the bowels of the earth and removed from the benign influence of heaven. The fertility of a soil cannot be exhausted by any other mean, but by overcropping. It may be suspended as in this instance, but not annihilated. Restore the soil to its native place and to that influence, of which it was deprived, and it will soon become equally productive as at first. It is not pretended that its fertility will be exerted all at once. Clay is a stubborn soil. It is neither so easily stimulated by manure nor by the benignity of the atmosphere, as other soil. It requires time and labour and expence to set it in motion; but when moved it retains its powers longer and makes very ample returns.

If any thing said on this subject is thought worthy of the attention of persons, who are desirous of straightening and of bringing down carse ridges, it may be proper to begin the operation by removing the *made* or meliorated soil, on the crown of the ridge, to one side; which may be done by two or three ploughings in one direction, turning the furrow always one way. This is easier than doing it with the spade. Then such a quantity of the buried soil may be cast with the spade from the crown of the ridge, as will fill up the furrows at pleasure: and lastly, the meliorated soil may be spread over the surface of the whole. If it is not thought enough to save the meliorated soil on the crown of the ridge alone; first one side of the ridge may be taken, and then the same process repeated on the other; by which means almost all the wrought soil may be kept on the surface. A

good

good summer fallow, a hearty doze of lime and the mixture of wrought mould will reanimate the new soil and restore its vegetative power to its primitive state; and a very few seasons will naturalize the whole soil, while the farmer has the advantage of straight ridges, moderately raised. Or, as Mr Anderson says in his essays on agriculture, relative to this subject, When you mean to proceed, let a number of men be collected, with spades, and then set a plough to draw a furrow directly across the ridges of the whole field, intended to be levelled. Divide this furrow into as many parts as you have labourers, allotting to each a ridge or two, more or less, according to their number and the height of the ridges. Let each of the labourers have orders, as soon as the plough has past that part assigned him, to begin to dig in the bottom of the furrow that the plough has *just then* made, about the middle of the side of the old ridge, keeping his face to the old furrow, working backwards till he comes to the middle of the old ridge, going deeper as he advances, suitable to the height he has to bring down; then let him turn towards the other furrow, and repeat the same on the other side of the ridge, so as to leave the bottom of the trench he has thus made across the ridge, entirely level, or as nearly so as possible. When he has finished that part of the furrow allotted to him, which the plough has made in going, let him then go and finish in the same manner his own portion of the furrow, which the plough makes in returning. The old furrows ought to be raised to a greater height than the middle of the old ridges, so as to make allowance for the subsiding of that loose earth.

He recommends to make these temporary or cross ridges 40 or 50 yards broad at least: for although some time will be lost in turning at the ends of the broad ridges, the advantage

vantage that is reaped by having few open furrows, is more than sufficient to counterbalance this loss: and in order to moderate the height that would be formed in the middle of each of these great ridges, it will always be proper to mark out the ridges, and draw the *furrow* that is to be the middle of each, some days before you collect your labourers to level the field, to prevent any hurry or loss of labour in the future operation of levelling. The field will thus be reduced at once to a proper level, and the rich earth that formed the surface of the old ridges will still be kept on the surface of the field to be formed into new ridges.

This judicious writer adds that the direction of the ridges ought to be north and south, if the field will permit, by which means, the east and west sides of the ridges, dividing the sun equally between them, will ripen at the same time. When the soil is so wet, as to require the raising of the ridges, he says that they ought to be made 12 feet wide and 20 inches high, and to be preserved always in the same form, by *casting*, that is, by ploughing two ridges together, beginning at the furrow that separates them, and ploughing round and round, till the two ridges be finished. The separating furrow is indeed raised a little higher than the furrows that bound the two ridges, but at the next ploughing, that inequality is corrected by reversing the operation.

Mr Paterfon of Castlehuntly's method is, first to open up, with the spade, a trench of about 10 feet broad, from end to end of the field, in the same direction the ridges are to be made. The upper surface of this 10 feet trench is laid upon one side, to be removed afterwards. Then the under soil of this trench is levelled and dressed by spade and wheelbarrow or carts, if necessary, at the same time giving the land a gentle fall at both ends to enable the water to run off
in

in the furrows towards the main drains. When this under foil had got its proper shape, he marked off another 10 feet trench, and with the spade threw the upper-foil of the second trench on the new formed under-foil of the first trench, so as to cover it compleatly and equally : and so on through the whole field. The upper foil of the first trench was carried round in carts and laid on the under foil of the last trench. The appearance of the field is then regular, rising in the middle and falling at both ends. He recommends ridges 18 feet wide. The whole expence is supposed to be L. 8 an acre.

When a hill is to be dressed, in order to be laid down in grass, it ought to receive the last furrow by going round in a spiral line, without ever turning the plough ; beginning at the base and ending at the top. This requires less labour and is more beautiful. In preparing the ground for this last furrow, it may be ploughed diagonally, to keep the foil from tumbling down hill, as has been mentioned above in respect of declivities : for this purpose the surface of the hill may be divided into three or more sections. The spiral furrow is the neatest method of finishing off a lawn, even of flat land near a gentleman's house, as it brings the whole surface to an uniform appearance, and pleases the eye more than having the lawn striped with furrows.

SECT. II. *Fallowing.*

WHEREVER a proper rotation of crops is not introduced, it is almost unnecessary to observe that fallowing in summer is unknown. The land intended for barley is ploughed either before winter or early in spring to prepare it for the seed-furrow in May, unless it be sown after potatoes ; in which case, nothing is given except the seed furrow. Wherever
potatoes

potatoes are planted with the plough in drills, the land is prepared generally by two or more ploughings, before that root is planted; and the more the soil is pulverized by these previous operations, the less trouble there is afterwards in hoeing and in keeping the potatoes clean. There is hardly any crop, that requires a better tilth than potatoes: which circumstance is well understood in the Highlands of Scotland, where the soil is admirably adapted for raising this valuable root: And if it is not proposed to sow any more barley, than in the potatoe bed, there is no other fallow necessary.

In the more fertile districts of the county, where soil and climate are calculated for raising various kinds of grain, where the farmers understand their business and have stock to enable them to make the most of their land, a clean summer-fallow or at least a fallow-crop is introduced into every rotation. A great proportion of the flat land being a stiff, cohesive clay, the only species of fallow-crop is turnip. Such a soil is unfriendly to potatoes. The former grows mostly on the surface, and when sown in drills, pushes its strong top-root boldly down through very stiff land; whereas the latter being a more tender feeder, its fibres more delicate, its pulp under ground, is locked up on all sides by an unyielding cohesive soil, it cannot expand nor forage to successfully in quest of its own subsistence. Nature therefore, the surest of all guides, teaches, that of any fallow-crops on clay, hitherto known in this country, turnips are the most proper. On loam or light soil, potatoes and the various kinds of garden greens thrive equally well. Cabbages and carrots and parsnips delight in a deep free soil.

There is no doubt but a clean fallow may meliorate the ground equally with any of these plants, or nearly so; and that when the land is very wild, no other can be used; yet

if the rents continue to advance, with the same rapidity they have done for some years past, prudence will direct the farmers to have less of their land idle, whatever be the nature of the soil, and to substitute fallow-crops more frequently in place of clean fallows. If winter vetches will answer in this climate, they ought to come in the place of fallow before wheat, as they can be used for green food or made into hay time enough to allow preparing the ground for the sowing of wheat; even spring vetches will answer, though the crop should be cut before it come to its full value.

On the strong soils of this part of the kingdom, fallow is a preparation for wheat; on the light land it is succeeded by a crop of barley with grass seeds. The practice in both cases is very judicious.

In many parts of Strathern and Strathallan, where the land is extremely light and gravelly, the farmers have a practice in the beginning of winter, of *ribbing* their land, i. e. they turn up and leave a furrow alternately, so that the soil, which is turned over by the plough, is left exactly on the top of the furrow, that is not stirred. After this operation the field has the appearance of the indented roller of a lint-mill. The principle appears to be just; and is the same with that of gardeners, who turn up their onion and celery-beds, through the winter, to expose as much surface as possible to the meliorating influence of the atmosphere. This is the winter fallow of these farmers. Their greatest or only mistake seems to be *ribbing* across the ridges and not water-furrowing the land, except in very few instances: By which neglect the ground lies all winter under stagnant water, if the field be nearly horizontal; and if the declination be considerable, the streams in the old furrows wash away the finest part of the soil. Perhaps it were still better if the farmer

had

had time, first of all to plough the whole field across, and after a short interval, to rib along the ridges.

Weak land may be easily reduced to a proper tilth by some of the fallow or green crops abovementioned; and even strong land by some of these, or by sowing pease or beans, or a mixture of both; except when it is rendered foul by bad seasons, by bad management, or much reduced by a succession of exhausting crops. In either of which cases, a thorough summer-fallow is the most immediate restorative to recruit the soil.

If it be possible to overtake it, the first furrow ought to be given before winter; no season being more friendly to exhausted land under fallow, than the winter; and no season for extirpating weeds equal to the summer. The former invigorates the soil; the latter cleans it. The second furrow ought to be given in the very beginning of May, after having been well harrowed two or three weeks before; but no harrow ought to touch it from the first furrow until the middle of April, that as much surface as possible may be exposed in the winter months. It is well known that frost dilates or increases the size of the clods of earth, and that thaw will contract them to their natural size. Thus by the alternate action and reaction of frost and thaw, during winter, the particles of the soil are loosened and the field in fallow rendered more mellow for the operations that succeed. From the beginning of May to the latter end of September or beginning of October, when the wheat is to be sown, the most experienced farmers endeavour to plough and harrow their summer-fallow alternately every two or three weeks; by which means every successive crop of weeds will have two or three weeks to grow, between a ploughing and a harrowing, and will never be able to carry seed, by standing any

longer. Every ploughing should be cross to the last: and the land must have been in v ry bad order indeed, which is not thoroughly dressed by this process. The dung is generally ploughed in with the last furrow. If the land had been very poor, it may be put down with the preceding furrow.

SECT. III. *Rotation of Crops.*

THE practice of intelligent and substantial farmers on soils of the same nature is in this respect nearly similar; while many others may be said to have no fixed rotation at all.

The mode of cropping land, in any country, is the surest test of the state of its agriculture. Therefore without knowing the ancient state of the husbandry of this part of the kingdom, as already detailed, and the progressive stages of its improvement, a stranger could not know what praise is due to the present race of farmers.

The most intelligent farmers in the district of Tullyallan and Culrois and Mensirie follow an uniform rotation. On all the flat land on both sides of the Earn, from the bridge of Forteviot to the Tay; on the clay land of the Carle of Gowrie; upon the banks of the Isla, from the bridge of Ruthven to its junction with the Tay; and on the best soil of either side of the Tay both above and below Perth, besides some parts of Monteath and several districts of less extent, where the land is either a deep loam or a rich clay, the same rotation is observed, by dividing the land into six lots, according to Rotation 1st. in the annexed table. The rotation on the clay land in Monteath, with some of the best farmers, is in eight divisions, (see Rot 2d.) in the table. The rotation on the light land in the Carle of Gowrie is in 5, (see Rot 3d.) The rotation in the lands of Auchtertyre, in some places near Callander, and in many other parts of the

the county, where the land is light and a regular rotation followed, it is in 7, (see Rot. 4th) In good lands of old infield, if the farms be small, the divisions are 6. (see Rot. 5.) Another rotation near Callander is in 5, (see Rot. 6.) The rotation at Lawers is in 4, (see Rot 7.) Near Drummond Castle, on the higher parts in the vicinity of the Cartie of Gowrie and about Coupar, the rotation is in 7, (see Rot. 8) A rotation on some lands on the Leath is in 5, (see Rot. 5.) On large farms at Wester Foulis, which consist of strong soil, the rotation is in 8, (see Rot. 10.) On other lands in 6, (see Rot. 11.)

TABLE

TABLE OF ROTATIONS.

	1.	2.	3.	4.	5.	6.	7.	8.
1. Carle of Gowrie, on the banks of the Earn, Ma, Tay, Nairn Estate, &c.	Fallow with lime and dung.	Wheat.	Peas and beans.	Barley with hay feeds.	Hay.	Oats.		
2. Monteth.	Fallow.	Wheat.	Peas and beans often drilled.	Barley with feeds.	Hay.	Pasture.	Wheat.	Oats.
3. Light land in Carle of Gowrie.	Beans.	Wheat.	Barley with feeds.	Hay or clover.	Oats.			
4. Auchtertyre and about Callander.	Green crop.	Bar with feeds.	Hay.	Pasture.	Ditto.	Ditto.	Oats.	
5. Ditto.	Green crops mostly fed off.	Bar with feeds.	Hay.	Pasture with sheep.	Ditto or oats.	Oats.		
6. At Callander.	Green crop.	Bar with feeds.	Hay.	Pasture.	Oats.			
7. At Lawers.	Turnips.	Barley with feeds.	Hay or 2 years in pasture.	Oats.				
8. Drummond Castle and higher parts of Gowrie and near Coupar.	Green crop.	Barley with feeds.	Hay.	Pasture.	Ditto.	Ditto.	Oats.	
9. On the Teath below Callander.	Oats.	Barley with feeds.	Hay.	Pasture.	Ditto.	Ditto.		
10. Foulis Wether.	Fallow or Green crop.	Wheat or oats.	Green crop or fallow.	Barley with feeds.	Hay.	Pasture.	Ditto.	Oats.
11. Ditto, on other land.	Green crop.	Barley with feeds.	Hay.	Pasture.	Ditto.	Oats.		

Upon

Upon the upland in Montcath the rotation is the same with No 8, except that barley is frequently taken for the first crop after ley, in place of oats, to avoid a heavy mul-
ture, which the oats are subjected to. The rotation upon the light land between Gask and Balgowan is much the same with that last mentioned. At Balgowan the rule in the leases is very simple, five years out of ten, in tillage, one being a green crop, the other five in pasture or hay.

In most parts of Strathallan, the land is kept in *thirds*, (i. e.) one third in tillage for three year, and two thirds always grafs. By this mode of culture the chief inconvenience is, that the farmers must once every three years, either have no barley, or sow it upon ley, or fallow a grafs field the preceding autumn for a barley crop. By this management however, it is impossible they can run out the land.

Of all these rotations, the first is the most universal and the most approved on clay or other strong soil. On good upland or dry field soil, the sixth or seventh seems to be the best. The fourth or eighth on light land. There is scarcely any soil so poor but what may be kept in heart by this last management. If it is extremely poor, in place of hay, it ought to be in pasture the first year after barley, and depastured always with sheep. Unless there is a supply of dung, (which on an extensive scale of farming may be required to other fields) the ninth rotation may be successfully adopted on land which is already in good order. Lime at least must be laid on with the grafs seeds, and two or three years in pasture may supply the place of dung, as an addition to the staple of the soil. If there be any dread of reducing the soil, the land may be left a year longer in pasture.

An invariable rule observed by the best improvers in the Carle of Gowrie and several other districts, where the cultivation

tivation of ground is properly understood, a rule essential to good husbandry, is, never to sow any white crop, except after fallow or a green crop; or in other words, not to sow two white crops successively on the same field. This rule will conduce much to keep the land always in good condition; and cannot be departed from without injuring the ground, unless dung be laid on with one of the white crops, if two should succeed one another; and that dung bought in. In arable farms, where the soil has a good body, it is another rule very generally observed, not to raise grass but for one year in every rotation, and sometimes to eat it green, in place of making it into hay. Whatever is eat green is sown without any mixture of rye-grass. But on a light soil it appears injudicious to make the rotation so close; the land requiring a year or two in pasture, according to its quality, to restore its strength, after being cropped. Where pease and beans are sown, either mixed or separately, they are frequently drilled by the most intelligent farmers; which practice is gaining ground and greatly meliorates the soil.

I see by my notes, that Mr Mylne of Mylnfield proposed upon light land, which required to be tenderly dealt with, to break it up from ley of three years old, to sow tares upon a second furrow, as early in spring as the season would permit, to eat off these tares with sheep, then to sow what are called brush turnips*, which are not expected to produce any roots, but in the months of March and April afford an excellent food for ewes and lambs. Whenever these were eaten off, the field was to be dressed for drilled turnips, to be sown about the 24th of June, which were also to be eat off

* Rape is better, because it can be eat both in autumn and spring, and in spring produces much more food than brush turnips. *Sir William Murray.*

off with sheep. In the spring following early oats were to be sown, along with grafs; and that kind of oats made choice of, to prevent the crop from lodging*.

Although a rotation of crops, fuitable to the nature of the foil, be conducive to the fertility of the ground and alfo to the profit of the poffeffor, yet it muft be acknowledged with regret, that in many parts of this county, the farmers have no regular rotation. They plough the land as long as it will carry any crop, and when it will not even carry oats, they let it out to reft, of which it has much need.

SECT. IV. *Crops commonly cultivated.*

THE culture of grain is the great object of hulbandry. The more induftry that is employed to enrich the foil of any country, the greater will be the produce of that country, and the more able to fupport an increafing population. However fpecious the reasoning of thofe writers, who wifh to recommend the grazing fyftem, by alledging that beef and mutton will, from any given extent of land, fupport the fame population, with the bread it could produce, yet if we have recourfe to matter of fact, it will appear evident beyond contradiction, that the beft cultivated countries both in ancient and modern times were the moft populous; and that the arable fyftem did produce more human food than the paftoral. Some diftricts in almoft every country are unfit for tillage; and in every judicious rotation of cropping there may be one or more crops of grafs. But where the

T

foil

* In this wet climate the oats will lodge three years out of four; this is therefore a fafer rotation—Oats, rape, barley and feeds. As the barley may be fown later than the oats, the ufe of the rape, which grows inceffantly in fpring, may be got, till the earlieft grafs comes up, for the ewes and lambs. This is the practice at Ochertyre. *Sir William Murray.*

soil is adapted by nature for the plough, it is a national evil to have large tracts of good arable land lying half idle, producing only less than the half, for the food of man, that it might afford, by a different management *.

WHEAT.

* This reasoning is less applicable to Scotland than in some parts of England. 1st. Because the loss from bad harvests is almost incalculable in most parts of Scotland. 2dly. Because so large a portion of the country is only fit for sheep, that must have winter pasture in the low grounds proportioned to summer pasture, and as they are constantly increasing their summer pasture, and may therefore be increased themselves, the extent of the winter pastures must be made to correspond. Indeed I assert that at this moment there is not north of the Tay, one fifth part of the winter pasture allotted for the sheep, that the hills will carry, that ought to be, either for the benefit of the community, the proprietor or the tenantry. In the West Highlands, where the climate is so wet, an arable system is flying in the face of nature. The Highlands now laid under sheep, produce twenty times more food than they formerly produced for the market, and their produce will yearly increase, from the meliorating nature of sheep, if they be allowed a proper proportion of low ground for winter food. Indeed nature seems to have pointed out the grounds that lie next the hills for that purpose, from their being so steep and so strong, or so thin and gravelly, that an arable system in the Highlands would be just as ridiculous as making a sheep-walk of the Carse of Gowrie. *Sir William Murray of Auchtertyre.*

Ans. When there happens to be a difference of opinion, (which is very seldom the case) between Sir William and me, on any point of farming, I am so diffident, that I am apt to distrust my own judgment in opposition to his: On the present subject, I am so unfortunate as to differ also from the opinion of another gentleman of very high professional knowledge in my immediate neighbourhood, with whom I have had several conferences upon this subject, without being able to convince or to be convinced.—There is however a meanness in subscribing to authority alone, without conviction.—If the question were about the *amount of rent*, sheep fed on an arable farm, might claim the preference, for a variety of reasons: but the *quantity of food* is the object of enquiry.

Wheat.

WHEAT is cultivated on the clay land in most parts of this county ; and in some places of the upland, where the soil is strong, and possessed by tenants, who are industrious and enterprising ; particularly in the Carse of Gowrie, in the districts of Strathmore and Stormont, around Perth, on both sides of the Earn from Forteviot to the Rhind, betwixt Valleyfield and Tullyallan, on the Devon near Menstrie and in Monteath ; and also in some places near Muthil, Dunblane and on the Pow. The cultivation of wheat has become general since a spirit for improvement has begun to go forth in the country ; and it will increase in proportion to the knowledge and wealth of the farmers and to the luxury of the inhabitants. The period is not long past, since it was thought, that wheat could not grow on the Earn west from Kilgriston, until the late Mr Oliphant of Rossie set the example in his

T 2

neighbourhood,

enquiry.—To do all possible justice to the objection, brought against my opinion, I have not changed one word of the text, which is impugned by such respectable authority. There I have granted, that land, which is *unfit* for an arable system, ought to be in pasture ; but whether good land, properly improved, for raising grain, be *most productive of human food*, by a regular rotation of cropping, or by lying for a tract of years in grass alone, is the question to be determined. We ought to reason *a posteriori* on farming. Let any man ask himself what is the cause of emigration in his own remembrance. Scotland has as many acres of land as ever ; and farming is better understood than ever. It is unnecessary to say more in this place, because the question may occur under another article. Our fathers had certainly too much land in tillage : the danger is that we may have too little. On this point every man must think for himself ; and it is with becoming deference I hold my own opinion. *Hanc veniam petimus damusque vicissim. The Author.*

neighbourhood, not only in this, but also in other improvements. Wheat was introduced into the vicinity of Crieff by the late Sir Patrick Murray of Auchtertyre, before the middle of this century; and I am informed on good authority, that he raised five successive crops of wheat on the same field, by the drill husbandry, and that the last crop yielded eight bolls the acre.

Wheat is generally sown after fallow or after pease and beans. When the land is fallowed, the first ploughing is given in autumn, as has been said already under the article of fallow, the second in May, and two or three afterwards as may be necessary. Wheat is sometimes sown on clover ley. In the Carse of Gowrie, where this grain is cultivated on a very extensive scale, and agriculture in general is reduced to a regularity of system, which is found in few other places, lime at the rate of 40 or 50 bolls of shells, wheat measure, is laid, in the month of July, on every acre, after being reduced to powdered lime. The land is then ploughed very shallow; and before the last ploughing for the seed is given, the dung from the straw-yard, without mixture of any other substance, is carried to the field, and thirty loads of a cart which will hold four bolls and a half of lime-shells, are laid on the acre in the end of August. After the dung is ploughed in, the seed, at the rate of ten or twelve pecks, is sown on the acre.

When wheat succeeds pease or other green crop, as soon as the preceding crop is carried off the land, dung at the rate above mentioned is laid on the acre, and from fourteen to sixteen pecks of seed are sown.

When wheat is sown upon clover ley, which is sometimes the case, on those farms in the Carse, where regular rotations are not adopted, one ploughing suffices, immediately
before

before the seed is sown, which is commonly one boll to the acre.

The species of wheat generally cultivated, are the Essex or common white, the old red, and a kind known by the name of brown wheat, which grows brownish in the chaff, but white in the grain. Spring wheat has been also tried, which produced a tolerable crop. A kind of wheat brought from the Cape of Good Hope to this part of the county by Robert Fairful, Esq. of Struie, has been sown for some years; but I do not hear that it is preferred by those gentlemen who have tried it, to the common kinds.

The quality of wheat may be preserved, a long time good for seed, by changing it from one kind of soil to another, according to the manner of preserving the quality of other species of grain. Care ought to be taken not to bring seed of this or any other kind of grain from a better to a worse soil, because it degenerates very rapidly, and seldom fulfils the farmer's expectations, even in the first crop. It is a far safer practice to bring seed from a worse soil and climate than your own, providing it be unmixed and of a proper quality.

Wheat is pickled with salt and water before it be sown, to prevent the smutt, and when the weaker grains are skimmed off, and the water poured from the rest, it is afterwards mixed with quick lime; others use a different and cheaper pickle universally known, which is less powerful, but more injurious to vegetation, unless the wheat be sown immediately. Ten bolls on the acre is a good average return on most lands, under proper management; in some cases, where the land is exceedingly rich, the return is more, in others less.

Wheat is sown from the 10th September until Martinmas, according to the season and other circumstances; and if it were not for fear of losing the proper opportunity (the *Tid* of
of

of sowing, as it is vulgarly called), the longer the wheat-feed is delayed, only giving it time to come fairly above ground before winter, so much the better; because the early sown wheat runs much to straw; whereas the late wheat carries the fullest and heaviest ear. In ground that is naturally dry, when the wheat is winter-proud, which commonly happens after a mild season without much frost, that luxuriance, which makes it too strong and too forward in Spring, ought to be checked by eating it down with sheep. This remedy is to be applied with great circumspection. If the soil be wet, they may poach it too much; and if they are kept too long upon it, they may bite so close, as to eat up the crown or heart of the plants, from which future growth should spring. But if done with judgment, the plants are made thereby to tiller and send forth new shoots, the field receives a top dressing, which increases its fertility, the treading of the feet consolidates the ground and fixes the plants more firmly in the soil, which may have become loose and spongy after the vicissitudes of the winter season.

It was recommended by the President of the Board, whose attention nothing escapes, to enquire into a circumstance relative to the seed-time in the Carse of Gowrie, which appeared problematical; and if it was found to be a fact, to endeavour to account for it: i. e. why the farmers in the flat land are enabled to sow, in Spring, more early than those in the breas or higher ground?

The breas in the Carse of Gowrie, like all other sloping land, which has inequalities of hills and vallies behind it, is more or less spouty, and these springs are more numerous, where the inequalities abound most, and rise above the general surface up or down the declivity, in proportion to the depth of the vallies behind. Whereas on the other hand,

all

all flat land has but few springs; the water that infests it being only the rain, which falls from the clouds. In the former case the water issues from a thousand sources, wherever it can force its way; in the latter it only stagnates on the surface where the ground is hollow. The operation of draining is both more easy and more certain, in the latter, than in the former situation. In this the evil to be prevented is more hidden and concealed; in that it is exposed to open view. Carse land may be drained effectually, where there is a fall; spouty land it is almost impossible to lay perfectly dry. Surface or open drains will suffice in the one; many diagonal subterraneous drains are required in the other, to lead the water to a main drain; and after all, some springs may have been missed, and some of the subterraneous drains may have been soon choked up. In short there are many chances against the land in the breas of the Carse of Gowrie and all other land in similar situations, being as effectually drained or as soon dry in spring or as soon ready for receiving the seed, in the sowing season, as the land that lies flat, if there be any tolerable fall. This is the case in many districts of this county, besides the Carse of Gowrie. In this and many other respects, when causes are investigated with care, they are found to operate often contrary to the first appearance of things. There are no problems in nature; they only appear problematical to us, owing to our inattention or ignorance. Supposing both soils to be equally well drained, in the breas and in the Carse of Gowrie, the farmers in both may sow at the same time; but the difficulty lies in being able to drain both equally.

Pease and Beans.

SOME soils are so light, as not to have strength sufficient to bring beans to maturity; but the sowing of pease is general, throughout the county. Before the introduction of potatoes and turnips on weak land, and the practice of summer fallowing on soils that are strong, the farmers had no other method of cleaning their ground but by this crop.

Pease and beans are sometimes sown together and at other times separately. A mixture of them in various proportions is sown almost in all places, where the farmers cultivate wheat; and in some places on a clay soil, where wheat has not been introduced.

Clean beans, or pease and beans, are generally sown broadcast, but sometimes they are drilled; a practice which ought to be more followed, than it is; because the beans branch out horizontally and carry more pods, both by means of being refreshed with new earth and by having more air; while the land is pulverized and better made for the succeeding crop of white victual. If the drills are at the distance of two feet, so as to admit of being horse-hoed, so much the better.

Pease and beans ought to be sown as early as the season will admit, that this precarious crop may be got early off; and this is the more necessary, if they are a preparation for wheat, that the operations of the wheat-seed be not deranged. About five or six firlots are allowed to an acre, if they be mixed; but clean beans are allowed two bolls, when sown broadcast: Less will suffice when they are drilled.

There is only one kind of bean cultivated in the fields throughout this county, called by some persons, the horse-bean; and so far as I could observe, there are only two kinds

kinds of pease, the early or spotted gray pea, generally known by the name of Hastings or the Peeble pea, which is seldom so luxuriant in the straw, but more prolific and of a larger grain than the old common species.

When beans, or the mixture of pease and beans, are ripe, they are commonly cut down with a sickle; a light crop is sometimes cut with a sythe. Some think it safer to cut them a little before they be fully ripe, to prevent their shedding afterwards, when they are moved. In a favourable season there is less need for this precaution; but in a rainy autumn, when this crop, by reason of its strong and succulent haum, must lie long on the ground and thereby endanger the loss of the whole grain, it is the more necessary. After they have lain a few days on the ground in handfuls, they are turned; and after a few days more, they are tied in small sheaves, with the straw of the pease in the crop, or any other straw, and set upright; which prevents in a great measure their suffering by being wet, admits the air more freely and renders them more handy to be carried off, when dry. The produce is various, but the average is from eight to ten bolls of a return from the acre; from a drilled crop sometimes more.

It has been remarked, that in the Highland districts, where the soil is for the most part light, the culture of beans is not attempted; yet the cultivation of pease is very general. In my last Survey, I observed with peculiar satisfaction the ingenuity of the farmers in Breadalbane and other inland places, in drying their pease, where the climate in autumn is frequently so rainy, that, by the ordinary process, the crop of pease would be inevitably lost. Whenever their pease are cut down, they set up three or more sticks twelve or sixteen feet long, tied together at the top and diverging from each

other towards the ground. They cover this frame with their pease, throwing them on in loose bunches, as long as any will stick; thus going over their whole field and repeating the operation, until all the pease are exposed, to the air, like so many large tramp-ricks of hay, in a grass field. The advantage is evident; the labour is soon over, being much less than that of turning and returning the pease, in the common way; and where wood is plentiful, there is little expence in that article. The rain, as it falls, drops off apace, the circulation of the air is not in the least intermitted, the shedding of the pease on the ground and the depredations of vermin are in a great measure prevented.

I heard of one instance of pease sown with oats; and Mr Stirling of Kippendavie, who tried the experiment, said that the oats not only supported the pease, while both were in the growth, which made the crop early, but kept them so open and upright, after they were bound in sheaves, as to admit the air freely; by which means, the pease were got in sooner than otherways. The pease, after they are thrashed out, may be separated from the oats, if necessary, by a common barn-sieve; and when consumed together, they make an excellent food for horses. An ingenious friend of mine remarked upon this experiment, that as pease are intended for a cleaning crop, if oats be intermixed, this intention is defeated; because the oats, by supporting the pease, prevent them from choking the under-growth and do themselves impoverish the ground. No doubt, this mixture is not so good for land, as a crop of clean pease, but it is no worse than a crop of oats; and the pease are more prolific and more easily preserved.

Barley.

Barley.

THIS grain is more or less in request, according as the distilleries are encouraged or otherways. The consumpt of it in beer is but small, in comparison of the quantity consumed in making spirits: and the excise laws are so fluctuating, that barley sells sometimes at one half of the price, which it brings in other seasons. Perhaps it is impracticable to render these laws more uniform in their operation, relative to this article, either in their principle or in their execution; but if they were brought to something like a fixed standard, both the tenantry and the landed interest would be much benefited, wherever the rents depend on the sale of barley; and a great proportion of this county is of that description.

In the more fertile districts and where the clay soil abounds, the farmer looks on his wheat, as the principal source of his profit; in the hilly country, the sale of cattle and sheep regulates the farmer's finances; but in the midland districts, barley is the staple commodity; and when the sale of that article is rendered irregular or the price capricious, by the unsteadiness of the excise laws respecting distillation, it is impossible that the landlord can either know at what rate to let his lands, or the tenant know at what rent to take them. It is in a great measure a random bargain in both.

The only remedy hitherto applied in this matter (and as far as it goes, it is wise and salutary), has been, that the gentlemen of the country, who are justices of the peace, have the power entrusted to them of interpreting and applying these laws. They know the state of the country better than any other; and can regulate their authority according to circumstances. Their interest in the general prosperity

of the nation directs them to hold the balance even between the sovereign and the subject, and their situation in life must place them far above the influence of any undue bias, in the execution of their trust. They have discernment to consider themselves as a part of the public, while they administer justice to individuals. They will therefore countenance and enforce the rigorous execution of the law, when it is necessary, or lean to the side of mercy, when the gripe of oppression seems to be too severe.

Without entering deeply into this subject, there appears to be one defect even in this remedy, which at present is the only corrective of the fluctuation of the excise laws; and that defect is, that illicit trade may make great havock, before it can be checked, according to the present form of procedure: the revenue may be robbed, or in years of scarcity, such as 1796, the very staff of life (while the whole grain of the country is insufficient to prevent a famine) may be smuggled into spirits, before the evil is corrected and before the justices have it in their power to fine a single culprit. The justices of the peace execute the law indeed; but they have not virtually the right of *citation* before their own tribunal. A complaint may be brought, when too late; and the evil become irremediable, before the remedy be applied. This could not happen, if the justices had a right to summon illegal distillers, *with or without* concurrence of the officers of excise, as they may find necessary.

Bear-barley or big, which consists of four rows in the ear, and long barley consisting of two rows, are, in some situations, sown separately, and in others they are mixed: clean barley on the stronger soils, the mixture or masslin on soils less strong, and bear where the soil is light. These are the most common kinds of this grain sown in Perthshire, the former

former being a few weeks later in ripening than the latter. Siberian or naked barley and also Russian barley of six rows in the ear, have been tried, but fell into disuse, by reason, I suppose, of the shortness of the straw of both, and the thickness of the husk of the last.

The finer the tilth the land is brought into, other circumstances being equal, the heavier is the crop of barley; because it is but a tender forager, and requires to be much assisted in quest of food.

Barley with or without grass seeds, for the most part, succeeds pease and beans, where these are sown. Where wheat is not sown, it follows turnips and potatoes. The wheat is generally sown upon the fallow, where it is cultivated. In some places, barley is sown upon ley, where the thirlage upon oats is accounted oppressive. In this case, the grass-field is ploughed before winter; it is harrowed thereafter, when the grass begins to shoot up in the seams; and at a proper interval is turned over for the seed furrow. By this management, good crops are raised on clover ley, of three years old, even without manure.

Ten or twelve pecks to the acre, when grass is sown, commonly produce six or seven bolls, and sometimes more, when the land is in good order*; but when grass seeds are not sown with the barley, two or three pecks more are given. English seed has been introduced occasionally into the Carse of Gowrie, but is found not to gratify the farmer's expectations, equally with the Scotch. The same observation occurs in the Survey of Mid Lothian. The cause of this failure

* Land may be said to be in good order, when it is clean of weeds, freed from obstructions to the plough, relieved of superfluous moisture, reduced to a proper tilth and well manured. See *Agricultural Maxims*, in the Appendix.

ure may be too violent a transition in soil or climate, especially if the transition be from better to worse. The climate of Scotland is unquestionably inferior to that of England, and there is as little doubt that the soil in general is inferior also, with some exceptions: Yet we have no grain that can thrive in such a variety of climates as the wheat. It grows with equal luxuriance under the polar circle and torrid zone. Barley is of a more delicate constitution, and requires to be naturalized before it can thrive, in a new climate. Man alone, of all animals, is fitted for every climate, and wheat alone, of all grains.

Barley is sown in May. In the vallies of the Highlands, where the soil, by its texture, is naturally hot, and the powerful reflection from the hills produces a rapid vegetation, it is often sown in the beginning of June. The weight of the barley, and the return from the acre, of this and all other kinds of grain, depend so much on the quality and treatment of the soil, together with a variety of other arbitrary circumstances, that it is impossible to speak of these matters with absolute precision. To state the highest returns that are reported to have been made, might appear to be straining, and to state the lowest is unnecessary. This crop is in the county of Perth universally cut down with the sickle.

Oats.

THIS grain is more copiously sown than any other in this country; and it is so hardy, that it will produce a tolerable crop, in circumstances, under which no other grain will thrive.

There is a great variety of different oats sown in the county; and very probably there are distinctions made
where

where there is little or no difference ; because country people frequently denominate grain after the place, they get it from ; and when two persons have oats of the very same kind from different places, these oats, though virtually of the same quality, acquire different names. The old Scotch or Polish oats prevail. The species most approved of in the Carse of Gowrie and the eastern districts, are these from Coupar Grange, the Grange of Bothrie, and from the Skrone in Angus. The first is also sown in the western parts of the county, and is esteemed, because it is a little earlier than the old Polish oat, and meals equally well. In Monteath some trials have been made of the red oat ; and the success which has attended these Essays promises to introduce it more generally : but it thrives only on rich land. Blainlie, which is equally early with the red oats, is much sown, especially on the higher grounds ; but it runs greatly to straw, and yields less meal than the common oat. Norfolk and Essex oats have been also tried, which are two weeks earlier than the common oats, and in this respect vie with the red and Blainlie oats ; but these are apt to shed the grain or *shake*, if allowed to be fully ripe, before they are cut down ; and their straw is bad provender for cattle, which is a loss to districts, where the hay is scarce. Another kind has been lately introduced into Monteath, which is also called Blainlie ; although it seems to me to be nothing more than a different denomination of the red oat. Like the red oat it is two weeks sooner ripe than the common oat, yields the same weight of meal, is not apt to shake, and the straw is good in all respects. At present it is in great repute and bids fair to keep its ground in good land. We have very little black oats, which the farmers were wont to sow in mossy and other soft ground ; and none of the
bearded

bearded gray oats, which are still used in the braes of Inverness-shire and other high bleak countries. In elevated situations or in wild mossy ground, oats of any colour or quality will soon become gray, bearded and black, extremely poor in the grain and thick in the husk : And it is probable, when any of our mountains were in tillage, that the grain sown was this meagre bearded oat, which is the poorest of all grain, and little heavier than the seed of good ryegrass. Such is the economy of nature, so ductile are all her progeny, and such a controuling power does the earth exert over her productions, that we not only find, as might be easily shewn, the different kinds of grain and other plants, but beasts and birds and fishes and even the human race itself, varied according to local circumstances, moulded to the climate, naturalized in due time to the soil, and accommodated to their situation.

The sowing of oats begins in March and is finished by the middle of April : And they are sown for the most part after grass, except in places, where husbandry is not understood ; where the farmers sow oats after barley, or what is worse, two or more crops of oats successively.

When the land is in proper order, sixteen or eighteen pecks will suffice to sow an acre ; and the return will be six or eight bolls. In poor land the sowing is more and the increase less. But whenever the farmer has no more than three returns, which is not unfrequent in the higher parts of the country ; the land ought to be dressed by a meliorating crop of potatoes or turnips, or allowed to run to grass, because, if all expences were calculated, it is a loss, in that case, to attempt the raising of any grain. Nature intended these places for pasture, and they will be more profitably employed

employed in rearing cattle and sheep, than under an arable system of any extent.

Some experienced farmers in Monteath give the oat land a gentle harrowing, before the seed is cast in, if the soil be stiff or the surface coarse; which fills the deep furrows and holes, is a saving of seed, makes the grain spring up at the same time, and ripen equally in harvest. The same gentlemen always harrow and sometimes roll the barley land, if a stiff clay, before the seed is sown.

The reaping season begins in some districts by the middle of August, and in others by the beginning of September; and unless the season be unfavourable, the harvest is finished by the middle or at farthest by the latter end of October. In the Highlands, where the mountains are of great altitude and crowded upon one another, when the harvest happens to be late, that lateness is not so frequently occasioned by the greenness of the crop, as by the autumnal rains. The clouds, wafted from the Atlantic by the westerly winds, are attracted by these mountains, and pour down deluges, at this critical season, from which the east coast is, in a great measure, free. In these cases, the attentive farmer calls out all his people, when a favourable day sets in, selects all his wettest sheaves from the shock (*flock*), ties them near the ear and sets them up separately in the shape of an umbrella, half-displayed; and if there be any wind, the sheaves, which had been wettest in the morning, are the driest before night. This practice is provincially called *geating*; and the whole crop is not unfrequently set up in this manner as fast as it is cut down, when the weather is very rainy; whereby the crop seldom fails to be secured.

It is the wish of the Board to render these Surveys as useful as possible; and therefore it is the duty and ought to be

the inclination of those, who write them, to adapt their directions to all circumstances and to the situation of all classes. In vain is it shown how to raise good crops, unless these crops are preserved. There is a sneer of ridicule and an air of contempt thrown on the practice of geating, which it by no means deserves. This obloquy has brought it into such disuse, that farmers, who wish to be esteemed as being professionally sensible, are deterred from geating, lest they should get the laugh against them.—Our opinions are warped with prejudice, both with respect to men and things, oftener than we are aware: but men of sense ought to divest themselves of prejudice.—In a favourable season any man may be a good farmer and collect his crop, without injury; but in a rainy autumn and in a late season, no other mode of harvesting bids so fairly for preserving a crop, as geating every sheaf, that is cut down wet.—It is a tempest alone, that tries the skill of a pilot.—If any farmer shall once experience the full benefit of this practice, he will probably keep his reapers in the field, not only when the dew is heavy or partial showers fall, which deter his neighbours, but as long as the rain will allow his people to stand out, at their work.

The only solid objections against geating upon a large scale are, that it occasions a great deal of additional labour, by binding the sheaves twice, and that there is a loss of grain, by its dropping from the geates on the ground. It may be answered, that these objections hold with equal force, against opening up the sheaves, after they have been spoilt in the shock and have lain for weeks in the field. And it may be answered farther, that there is more loss of labour, in an untied season, by throwing all the reapers idle, whenever it falls, than by binding the sheaves twice. When the geates are dry, or ready to be gathered in, one man can bind

more

more than an acre in a day, whose wages are not to be compared to the loss of frequently interrupting the labour of all the reapers. It is certainly less waste to lose a few stalks, than to run the risk of damaging or losing the greater part of the crop, by its growing in the shock. Very little is dropt from the sheaves, if they be carefully handled; and if any at all is dropt, it is easily and effectually gathered up, by raking.—Every one knows that moisture, lodging in the sheaves, when they are heaped close together, is the cause of their growing. Having single sheaves and these opened up, prevents moisture from lodging. If rain falls, it runs instantly off: and when wind blows, they are immediately dry, and fit for being bound and stacked. No season is so rainy or inclement, as to baffle the endeavours of common industry, in saving every sheaf of a crop, by this process; but many seasons, in this climate, occur, which render all the efforts of the most industrious farmer ineffectual by the common way of harvesting.

Reaping with sythes is rarely practised in this county; the whole grain is mostly cut down with the sickle. Seven reapers generally have a man to bind and stook after them; or six, if the grain be heavy. In large fields, two men will bind to fourteen or sixteen reapers, in most kinds of grain; and one man follows the two binders, to stook the corn. The stooks consist of twelve sheaves; ten set upon their butts, in two parallel rows, with their upper ends resting against each other, the opening betwixt the sheaves being large enough to hold the stoker's left foot and leg, while he is setting every pair upon their ends. The two hood sheaves are opened from the knot of the band forward to the top, so as to be all of an equal thickness in the straw, and laid on in opposite directions, as a covering, with the

butt-ends uppermost and touching each other. The stooks ought always to be placed south and north; that one side may have the sun in the forenoon, and the other in the afternoon. Some farmers, by mistake, set their end to the point, from which the wind most frequently blows; but the winds may shift their course, which the sun never does*.

A gentleman, well versant in farming, recommends to set up the corns in a rainy season or climate, not in common shocks of twelve sheaves, but in six sheaves, after this manner. Four sheaves are set on their butts, at the distance of half a pace from each other, more or less according to their length, with all the four tops meeting in a point above, in the shape of the four lateral angles of a pyramid. The two remaining sheaves are made into the form of geats and put on for a covering, the one above the other. This construction will be well fitted, I apprehend, for *winning* † or drying the corn, provided it can resist the violence of strong winds.

In a boisterous autumn, and frequently about the time of the equinox, the best made stooks are overturned; in which case some indolent people leave their corns scattered all over the fields, until the storm is over. But were it not much better management, to set up the stooks, when they fell, so that

* Perhaps placing the stooks a little to the south of south west will give a fair average chance of both advantages, at least by this means the winds will be taken in for their share by coming nearer their ordinary currents in Scotland. *Sir William Murray.*

To make a stook properly there should be no more standing sheaves than the two heading ones will compleatly cover, and the bottom of these sheaves should finish off the top of the stook, and this will resist more wind than any other form. *Sir William Murray.*

† If *winning* be a Scotticism or new word, in this acceptation, it is easily understood and has more precision than *drying*, because corn may and ought to be *dry*, when cut down, but cannot be *winning*, till some days thereafter. See *Elements of Criticism*, as to new words.

that the winds might dry up the rain, and that when the hurricane was over, the corns would perhaps be in a condition to be gathered in: whereas if left to lie in separate sheaves on the ground, the whole would remain drenched in water, when the violence of the wind had abated.

Every well regulated farm ought to have stathels, for preserving the stacks from vermin and to keep the under sheaves free of dampness. Unless the farmer has a long lease, it is but reasonable that the expence of these and of every other building, which is of permanent advantage to the farm, thereby enhancing its value, should be defrayed in the first instance by the landlord. The farmer's stock ought not to be diverted into extraneous channels, but applied to enrich the soil, that he may raise good crops, and be enabled to go on, in his operations, with spirit.

The best form of corn stacks is circular, with a cylindrical body and a conical top, diverging a little towards the eaves (*easing*). The builder commonly takes care that the outer row of sheaves be always sloping a little, as he goes round, all the way from the ground to the crown of the stack; which circumstance throws off the rain, and prevents the wind from blowing it into the body of the stack, to injure the corn. This is easily attended to, by keeping the heart of the stack always higher than the outside, in the time of building.

When grain is collected, without being perfectly dry (*winn*), the stacks are frequently made with vents, which are continued past the easing, with a small triangular opening built on a frame of wood, on the windward side, at the bottom, to admit the air. These vents are often made with timber frames, either temporary, by tying a few sticks together at the top, or constructed so as to be kept from year to year.

Their

Their construction is in the form of two ladders, diverging at the bottom, to make them stand firm, and almost uniting at the top: the four stoops being bound together with bars at proper distances. This precaution is very necessary, in a rainy climate, or in a backward harvest; but the vents ought never to be used, if they can be avoided, with safety to the corn, because they are a lodging for vermin.

The reapers are hired from villages within the different districts, or come from a distance, at that busy season, in quest of employment. According to the custom of different places, they are sometimes hired by the hour or by the day; sometimes by the week, and at other times during the harvest, whether the reaping season be long or short. Their wages are various, according as the crop is forward or not in ripening, and to the number of reapers that apply. The smaller farmers feed them with their own household servants; those who have extensive farms feed them in a separate house, with pottage and milk for breakfast and supper, and bread and beer for dinner.

All the people of fashion make use of wheaten bread, which is either baked in their own houses, or bought from the adjacent towns and villages. The most wealthy of the farmers use this bread also at their tables, more than any other kind; and even all the inhabitants of every denomination, except in the most inland districts, hardly think their guests suitably entertained, at any public meetings, without wheaten bread. The consumption has increased amazingly of late. You will find one, often two bakers, well employed, where not a baker nor an oven were to be seen, within twenty miles of the place, about fifteen years ago.

In our towns the magistrates are empowered to take cognizance of the assize of bread; but in the villages there is

no regulation adopted hitherto, to prevent frauds, in a matter of such importance. The baron baillie of the superior of each village ought to have the charge of regulating the weight and quality of bread, unless the nearest justice of the peace, having an interest in the country, shall take that charge.

Cakes made of oat-meal are much used by the middling ranks. Bread of the flour of pease is still in use, especially in the low country, but not so general as in former times. The wheaten bread has very much supplanted the oat-cakes, and the cakes have supplanted the pease-bread. Cakes made of the flour of barley are the common bread of the Highlanders. When the barley is twice *shilled*, i. e. put twice through the mill, on purpose to take off the rind more completely, and then grinded small, fine flaccid cakes are made of its flour, not uncommon at the tables of the affluent in these districts: but it requires to be used, when newly baked, before it become hard and unpleasant.

The farmers have need of all their attention in making choice of the grain most proper for seed. Care ought to be taken that it be not adulterated with any extraneous feeds; that it have no blackness at the extremity of the grain; and that it be not of a dark brown colour; this indicates its having heated in the stack, that is a sign of its having lain too long in the fields, under bleaching rains, after being reaped. The smallest experience will discover, if it be mouldy, which arises from dampness, or if it be thrunk in the husk, which arises from its having been cut green.

We ought to steep, not only wheat, but other seeds, oftener than we do; because all the weak grains swim on the top and may be skimmed off; and in a dry May, when the
soil

soil is parched, the barley vegetates more equally and sooner, after being steeped *.

The proper time of sowing any grain, it is impossible to regulate by a strict adherence to any particular day of a month. A due temperature of the season, suited to the nature of the grain, with respect to heat or cold, drought or wet, because these influence the state of the earth, should be carefully attended to. The appearance of certain birds of passage, whose instinct, so far as it goes, is a surer guide than our reason; the budding or foliation of particular trees; the flowering of particular wild plants, all of which are uniformly regulated by the season, may, after the observations of a few years, furnish the husbandman with unerring signs, to direct him in sowing, with judgment and success. At any rate, it is much safer, in most cases, to be somewhat too early, by catching a good tid, than to be too late †.

Various rules have been given about sowing thick or thin. There are few subjects on which all men are agreed: Nor have I the confidence to suppose, that my opinion will pass current with all men, on this or many other points, where there is a diversity of sentiments. Every individual follows his own opinion, whether it be guided by habit, by fashion, by whim or by sound understanding. I hesitate not however to say, that land in good order ought to be sown thin, because the grain will stock, the straw will be strong, the ears large, and the grain plump and heavy: whereas, if sown thick, the reverse of all this will happen; besides that there is a waste of seed and the crop will lodge and rot on the ground.

* This is an important observation. *Sir William Murray.*

† If the land be in high order, there is no danger in sowing early, because the crop in such land is sure to recover a check. *Sir William Murray.*

ground. Poor land which is foul must be sown thick, to keep down the weeds, otherways there is no crop at all.

By the drill husbandry, the seeds of grain may be sown at any desired depth; but this is not the case, by sowing in broad-cast: it is impossible to prevent the seeds from being unequally buried below the surface, although it may be in a certain degree guarded against by a rule already given. Some plants will spring from a depth, from which others will never rise. This circumstance claims the attention of the intelligent farmer. It is also of importance to observe, that in a light soil the air penetrates deeper than in a soil which is stiff. In the former therefore you may sow deeper than in the latter; because it is certain that no seed can vegetate, when deprived of air; and some seem to require more, others less.—This element is as requisite for the vegetation of plants, as for the respiration of animals.—If the soil be sluggish, the seed furrow ought to be shallow, otherways some seeds may even remain fresh in the earth and never vegetate. If the field be in good tilth, a shallow furrow has the additional advantage, when turned nicely, that it gives the crop the appearance of having been drilled.

Flax.

THE culture of flax is universal in this part of the kingdom, but is not carried to such an extent in any other place as in the districts of Stormont, the west end of Strathmore and in Athol. The farmers in other places generally grow some for their own use; and where the land is more favourable for that plant, they are able to supply those, whose soil does not raise it to advantage. The clay land seems to be of too close a texture for its tender roots, and binds too much to allow the fibres to expand themselves in quest of nourishment.

ment. The light sandy soil, on the other hand, is too weak to carry a heavy crop, and is too much exhausted by it, to render the lint crop a sufficient recompense for the chance of failure in the subsequent crops. The fittest soil for lint is a deep loam or rich haugh, on a moist bottom, where the pores are not so close as in clay or till, and the strength of the soil fully equal to the food which the plant requires.

The foot of every brook in the Highlands, where the water runs slowly, and plenty of sediment is deposited, making an annual addition to the soil, carries amazing crops of lint. On the banks of our large rivers, where the land is occasionally flooded by back-water, the lint is generally a good crop: and it is raised successfully, the second crop, after good clover ley; which saves weeding; but this ought to be sparingly tried, because it is a bad rotation, unless a fallow crop succeed.

In these countries, from which the greatest quantity of flax and of seed is imported, the most favourite soil for this crop is on the banks of large and gentle-flowing rivers, which, by their flooding, have in the course of ages, formed the richest and deepest mould. This may show us, what is its native soil, and where it can be cultivated with most profit in this country.

In these parts of the county where wheat is plentifully propagated, the flax-husbandry is less attended to. Judgment is discovered in this practice, because both crops scourge the ground: and in a close rotation an intelligent farmer can scarcely introduce both.

In the Carse of Gowrie, Mr Donaldson says that flax is cultivated in small quantities, and sells from nine to twelve pounds the acre, when disposed of before pulling.

Lint-seed is esteemed to be good, when it is large, oily,
and

and of a bright colour, and the germ somewhat green. To know whether it be oily, a few grains of it may be thrown on hot iron, and it will crackle instantly and blaze briskly; if plump and heavy, it will sink in water.

If lintseed be sown, with an intention to let the flax remain to carry ripe seed, it ought to be thin, that the plants may have plenty of air, be in less danger of lodging, and have room to grow to their full size. If it be sown, on purpose to have fine soft flax, it should be sown pretty thick, that the plants may rise the closer together, may grow slender and tall, which adds much to the fineness of its quality. Another circumstance worthy of notice is, that if the saving of seed is the object, the flax must stand so long on the field, to bring the seed to maturity, that the rind becomes coarse and dry; and if the flax is the object, the crop must be pulled somewhat green, to preserve its fine glossy quality; in which case the seed has not time to arrive at perfection. So that it is scarcely possible to have silky flax and ripe seed from the same crop*.

The most common time for pulling flax, is, when its stalks begin to turn yellow, which appearance originates first at the root, when the leaves of the under part begin to fall off, and the seeds to grow brown.—Each of the capsules has ten cells, and in each cell there is one seed.—Although the farmer does not choose to risk the quality of his lint, by allowing the seed to come to maturity, yet the seed ought to be ripped off, after the lint, in the sheaves, has dried so much, that this operation may be performed without tearing the rind; and this seed may be sold to the oil-mill for hav-

Y 2

ing

* Perhaps lint, unless allowed to ripen its seed, is not a very scouring crop, but yields nothing that can be converted into manure, which is an unanswerable objection to it, except in a very partial extent or under very favourable circumstances. *Sir William Murray.*

ing the oil extracted. The cakes are an excellent food for cattle or may be used on grass lands as a top dressing.

Soft water is best for steeping lint: and it is sufficiently watered, when the reed breaks without bending, and the rind parts easily from the reed. It is absurd to leave the lint a certain number of days invariably in the canal. When the weather is warm and the water is soft, it is much sooner ready than otherways. The longer the water has been let into the canal, before the lint is immersed into it, the more rapid the putrefaction. Lint is ready to be taken up from the field, whenever the bark blisters and rises from the reed.

In order to save the seed of flax, some persons who are knowing in the business, recommend to set up the lint sheaves, after pulling it, in stooks, like grain, and when thoroughly winn, to stack it, until the next spring. The seed is then easily rubbed off by a roller, without injury to the flax, by putting the sheaves head to head. The profit on saving the seed is estimated to be from L. 5 to L. 6 per acre. The farmer, by this process, has the whole summer before him, to water and dress his lint, without incroaching on the operations of the autumn, in these respects.

It must, however, be acknowledged that this crop makes no return of manure, and that by the thickness of its stalk, the smallness of its leaf, the number of seeds it carries, and its fibrous roots, it impoverishes soil to a great degree. But when it is managed with judgment, it can purchase manure *, and besides bring a considerable profit; nor does it rob the ground more than some other culmiferous plants, especially
wheat,

* Lime and marl, being only stimulating manures, are no proper return for a crop of lint, though they will certainly prove a temporary one. *Sir William Murray.*

wheat, provided the land be fallowed whenever the lint is pulled. Red clover and other grafs seeds are sometimes sown with flax, and are found to thrive very well.

In the latter end of October 1795, I observed vast fields of lint, in all that tract of country, between the Seedlaw hills and the Grampians, and not a little in other places, lying spread upon the ground, till the grafs had almost covered it. If this be the general practice, it is in a high degree prejudicial to the quality of the lint. The excessive rains of that autumn may have prevented the farmers from getting their flax dried, after it was fully grafsed and long enough on the field. But why was it not set upon end? why were there no attempts made to expose it to the wind, during any intervals of dry weather? In the course of two months, there must have been some intermission of the rain. An enterprising farmer will seize every favourable moment, to forward the operations, in which he is interested; and not sit, with his hands across, waiting for a long tract of ferene weather, which may not come, till his all be lost. In the rainy climate of our insular situation, surrounded with high mountains, the business of the husbandman, must often, in any season, particularly in harvest, be done in snatches, or not done at all. There are favourable moments in all the business of life, especially in farming, which if once past, a similar opportunity may never recur. I knew a farmer, in such a season as is here alluded to, who saved his crop while his neighbours lost theirs, by employing his people to work all night and allowing them to lie by all day; because the nights were fair and clear, with some wind and frost, and the days rainy*.

In

* A circumstance that frequently occurs in bad harvests, indeed almost uniformly in the climate of Scotland. *Sir William Murray.*

In watering lint it is not uncommon to give it too little time in the canal, and too much on the field. It were a more sensible and safer procedure, for securing the crop, and better also for the quality of the lint, to let it lie in the water, until it be fully ready, and either not to spread it at all, or to give it only a short time on the grafs. It might be set upon end, like the geats of corn, and exposed to the wind, as soon as the water had dropped from it, for a short space, on the brink of the canal : and if there was any doubt of its been fully watered, a little more time might be given it in this situation. This is the practice abroad in the lint-countries, and in some places at home. The lint is thus watered equally, which is hardly possible, on a field, where the under part, which is always buried in grafs and corroded with dew, if it remains long in that situation, must be rotten before the upper part be sufficiently done : and perhaps the whole may be lost in a rainy season, before it can be got up. By that management, the silky gloss and green colour of the flax is equally and more effectually preserved. It is a mere deception to suppose, that bleaching lint on the field will facilitate the bleaching of the cloth. No cloth is so easily or so uniformly bleached, as that made of lint, which is fully and equally watered, in the canal.

The uncommon attention paid to the cultivation of flax in this country, especially in the districts mentioned in the beginning of this article, will appear from the annexed table, with which I was favoured by Mr Arbuthnot secretary to the trustees for manufactures and fisheries in Scotland. When one considers, besides the number of yards of linen cloth mentioned in the table, what quantity the inhabitants of the county must use for their own wear, which never comes to market, and is not stamped, and also the
vast

vaſt quantity of linen yarn, that is ſold to the manufacturers of chequed goods in Glaſgow and elſewhere, the returns from the culture of flax is a matter of great moment to this part of the kingdom, and will, in ſome meaſure, juſtify me in dwelling ſo long on this ſubject. It muſt be highly gratifying to every perſon, who wiſhes well to his country, to obſerve the progreſſive induſtry and the increaſing wealth of a ſingle county, in *only one* article, ſo well authenticated. What muſt be the growing proſperity of the county of Perth, if equally ſucceſſful in a variety of other articles ! How rapid the progreſs of the proſperity of Great Britain, ſuppoſing all its counties to keep pace with that of Perth !

So great is the profit ariſing from flax, that one gentleman, who is in the foremoſt rank of improvers in the eaſtern part of the county, expreſſed an opinion that the value of the flax manufactured into home-linen, ſtamped linen, and ſold in yarn, in the ſhire of Perth, was equal to the whole land rent *. As he wiſhed to have data, either to correct or ſupport his opinion, it is to me an object of regret, that all the neceſſary data are beyond my power to condeſcend upon, with any degree of preciſion. We know what is ſtamped ; And may we not compute, that the home-conſumpt which is not ſtamped and the yarn ſold out of the county and applied to various purpoſes that never comes into any of theſe accounts, is at leaſt equal to the amount of Mr Arbuthnot's ſum for ſtamped linen : in all amounting to L. 248,619 : 6 : 8, a ſum *far beyond* the opinion of moſt people ?

It is ſingular that, in a court of law, a crop of lint will be found to be a green crop ; and that if a proprietor were to
raiſe

* In the pariſh of Alyth the whole land rent does not amount to L. 4,000, but the value of linen ſtamped there is L. 10,000 at leaſt.

raise an action against a tenant for sowing flax in place of a meliorating crop, in his rotation, the proprietor would be cast. The only remedy in this case, is to set aside the question, and prevent any dispute on that point, by the terms and articles of the lease, specifying particularly what quantity of lint-seed is annually to be sown.

Potatoes.

THE culture of potatoes is carried to a great extent in this county, especially in the Highlands. In a rainy climate and on a light soil, no species of crop promises equal returns to the husbandman or equal utility to the public. When new ground is to be reclaimed by a potatoe crop, they are planted with the spade, in what are called lazy beds, which are generally about six feet broad, with a trench about two or three feet wide, upon every side, always pointing towards the bottom of the field. When these trenches are marked off with a line and spade, the dung is laid on the bed, and then the potatoe-seeds, in rows, across the bed, at such a distance as to allow room for a hoe. The first spit from the trench is laid on the potatoes, with the grassy side downwards, if the land be new; a second spit of mould is taken and spread over to fill up the openings. When the young shoots appear, another springling of earth is given from the trenches: and the hoe succeeds, when it is necessary.

In arable ground potatoes are planted for the most part with the plough. Previous to this, the land ought to be reduced to a good tilth. The dung in some instances is spread on the field, and the potatoe-seeds dropt into every third furrow. Some farmers leave the land in this state, till weeds appear, others harrow the land across, whenever the potatoes are planted. I should approve of the first method

thod of harrowing. There being three furrows for every drill, which gives plenty of room for horse-hoeing.

In other cases, the land is drilled by being laid in small ridges of little more than two furrows, thrown up against each other. The dung is spread carefully from the cart into each drill, the horse going in one, and the wheels in those on each side. After the potatoes are dropt in, above the dung, the plough closes the drills, by returning each furrow to the place, from which it was taken, in the manner of cleaving ridges. The land is harrowed and horse-hoed, when necessary, as in the other method.

At other times, potatoes are planted with a foot dipple, in arable ground, after it has been duly pulverized. The dung is either put down with the last ploughing or more frequently laid on the surface, when they receive the first covering with the spade, from alleys left purposely between the ridges. The hand hoe alone can be applied afterwards. This method is said to give the greatest return from the acre; but the plough requires less labour, and is by far better for the ground.

Many complaints have been made of a disease called the curl, in various reports from the east and south; but it being hitherto unknown in this country I shall say little upon that subject. On a light mellow soil, with a dry bottom and a frequent change of seed, I suppose it seldom appears.

In writing a report of this nature, it is not so much my province to attempt giving specific rules about the culture of any plant, as it is, to narrate, with fidelity, the practice of the county; and to give some detail of the culture adopted by our best farmers.

Potatoes ought to be frequently raised from the seed, because they degenerate faster than is commonly supposed.

Unless the seed is renewed or changed, they soon become dark-coloured at the root end, where there are fewest eyes, after they are boiled. The process of raising them from the seed is well known, and exhibits a beautiful and unexpected variety.

Of all roots this is the most valuable. It grows on the poorest soil, is in season at least nine months of the year, is relished by every animal, affords an excellent food for man, when properly dressed, pays neither kiln nor mill dues, is soon brought from the field to the table, supplies the place of a fallow, by pulverizing the ground and clearing it of weeds, and yields more sustenance by the acre than any plant we know, not excepting even maize, which Mr Young applauds in his account of the agriculture of France. It has already done more, and is able, by being cultivated extensively, to do more, in keeping our people from emigrating, than any other expedient, which has been hitherto devised. Feed your people; and emigration will not only stop, but the population of the country will increase.

Robert Fairfull, Esq. of Struie, in my neighbourhood, is now employing the same knowledge in cultivating his farm at the Roman camp of Callander, which he exemplified, in ploughing the Indian ocean, in the service of his country; and is equally successful in both. He raises fine farinaceous potatoes, at the rate of one hundred and twenty one bolls, an acre, being thirty-eight returns of the quantity of seed planted. There may be returns in other places equal to this, both in respect of increase and quality; but I quote this instance, because the produce and the land were both measured by myself.

Sir William Stirling of Ardoch assured me, that he has often raised forty bolls of potatoes, on an acre of light

moor

moor for a first crop, which had not formerly been worth one shilling of yearly rent. Value the boll at five shillings only; and you have this acre 200 times more productive of food than it was before. I am not prone to give implicit faith to the accounts of all the extraordinary returns we read of in books or receive intelligence of otherways; and therefore declined to trouble the reader with any thing that appeared to myself marvellous in that respect. But these returns above mentioned, are authentic past any possibility doubt.

Dry dung is best for potatoes *. Horse dung or dry litter are the best. Some persons have raised heavy crops, by using ferns or leaves of trees, as a manure; and I heard of one skilful farmer, who raised them successfully, in lazy beds, without any other manure, except green broom, chopped into small cuttings, a few inches long. If lime is applied to the potatoe crop, it ought to be laid on the surface and wrought there by the hoeing, or laid on the land with the preceding crop; because if it be much about the roots, although it does not hurt the flavour, it generally frets the skin. Good crops of potatoes have been cultivated by wrapping each seedling in a rag of woolen cloth and laying it in the earth without any other manure.

They thrive best in a light dry soil, of which there is a

Z 2

great

* I prefer light or long moist dung for potatoes; but as to the extensive cultivation and great utility of this root, I perfectly coincide with Dr Robertson. We have nothing equal to it. *W. D.*

I very much respect Mr Dann's opinion; but in this instance I hold my own; because I find from experience, that unless the dung be dry when laid in the drill, I am obliged to let it lie uncovered, until it become dry, before I plant potatoes. Wet dung or even wet land, never fails to give the potatoes of this country a cankered skin and a bad taste; but this may not be the case every where.

great proportion in this county. Very rich loam may produce great crops, and large roots, but they are always inferior in flavour and mealiness, to these raised on lighter and poorer soil. Where the land is wet, both the quality and quantity of the potatoes are inferior.—If the field be a heavy moist soil, the black potatoe ought to be planted. The outer coat of this root is of a footy colour, but when this coat is rubbed off, the raw potatoes are of a bright purple colour. These keep longest in spring, without budding, and are good for the table.—Where the land is tenacious, they are unable to expand themselves in the growth, or the tender fibres to penetrate the soil in quest of nourishment. Mosses, when they are drained, are a favourable soil for potatoes, because the parts are easily separated, and the root finds plenty of room to swell to its full size.—Potatoes are planted in April or the very beginning of May; and are raised in October, either with the plough or with the three pronged forks used for dung (provincially grapes). For the most part, they are left during winter in the field, in heaps, which are carefully covered with straw and earth, well clapped down with a spade, and a row of long turf generally over all. These heaps ought never to be in deep pits, for fear of under water: but are made on a gentle declivity, if there be any in the field, shaped like the roof of a house and lying south and north, that each side of the heap may have the benefit of the sun alternately, to prevent the frost from penetrating deeper, on one side than on the other.

Fanciful projectors recommend to boil potatoes, not with water, but with steam, without understanding that the water removes some qualities of the root, less friendly to nutrition, which steam cannot extract. In all this country, the whole water is carefully poured off, when the potatoes

are

are thoroughly boiled ; and the pot is set a second time over the fire, for a few minutes, which makes them dry and sweet. The most palatable potatoes are easily distinguished, because they swell and burst in the skin after they are boiled. If they are left to burst too much, it is impossible to make them dry. The bursting also distinguishes ripe from unripe potatoes.

The early frosts are very pernicious to this root ; and indeed to all the crops in this high latitude. But against this injury, which the ingenuity of man cannot easily prevent, the kindness of Providence has provided a remedy, in which we have no hand. When frosty mildews, which would blight our crops, come on before the middle or latter end of September, there commonly falls out next morning a small shower of drizzling rain, which corrects the baneful effects of the frost, by restoring the circulation of the plants.

In the reign of William the Third, when these mildews had occasioned a scarcity in the nation, by successive bad crops, the people, in many places, had a custom of running along the unripe corns, early in the morning, with ropes extended betwixt two persons, to whip of the frosty particles, before they were dissolved by the next sun. By the time, that the corns are generally filled, and the grain brought to maturity in this country, these showers, which are correctives of the early frost, cease to fall, being no longer necessary for that purpose.

In this climate, the frost is not only early in the autumn, but often late in the spring. If potatoes are planted very early in spring, they are in danger of meeting the late frost, after they are sprung up : and their shoots are so extremely tender, that, in this event, the crop is totally ruined. We have no kind of root, or of grain, which suffers more immediately

mediately from frost. In planting potatoes, therefore, it is safer to be somewhat late, than too early. About ten years ago, I had some early-planted potatoes destroyed upon the 7th of June, by the frost of one night: and a neighbour of mine had his potatoes in the same predicament last summer. The shoots of mine had been very promising, and about six inches long. They were frost-bitten down to the very surface of the earth; and both the leaves and haulm became like dried tobacco-leaves, and fell off. A great number of new shoots sprung afresh from every plant, but the roots in the autumn were no larger than the yolk of an egg.—As a remedy to prevent this loss, it is recommended to spread litter over them: and although it be the only protection for potatoes, which are planted before the usual time, yet it is liable to several inconveniencies. Gentlemen may run risks, in order to have a few early potatoes for their tables; but in the general practice it may fail, by not covering the surface of the ground, until all the spring frost is over: For when the prospect of danger is not immediate, the generality of mankind are prone to procrastinate and be off their guard, allured with a gleam of hope, by which they are finally disappointed.

The autumnal frost is not so dangerous as that in the beginning of summer, because the potatoes are ripe before the beginning of October. The decay of the haulm gives notice of the approaching danger; beyond which period it is in vain to expect any addition to their growth. The earth, however, forms a covering, which is always proof against the frost of a few nights; the first frosts come slowly on: and the farmers have time, either to get up their potatoes or to protect them in the ground. In the year 1782, the inhabitants of this country were taken unawares, in this respect.

spect. Having been accustomed before that period to delay raising their potatoes, until the rest of their crop was housed, all their exertions were employed in saving their corns; and when they had leisure, in the end of November, to look after their potatoes, they were so firmly locked down by the severity of the frost, that it required picks and leavers to open the ground: and the few, they recovered, were very much spoilt.

It may be of use in these critical cases, to remark, that when potatoes are frost-bitten, either in the heaps during winter, or before they are dug up in the autumn, such as are not soft to the touch and spoilt beyond recovery, may be restored by immersing them in cold water for half an hour. This immersion will extract the frosty particles and make them tolerable food, although they have a heavy disagreeable sweetness, which cannot be removed. All the soft ones must be thrown to the dung-hill; even swine, which devour almost any thing that can be eaten, will not touch them.*

Potatoes not only disagree with frost, but also with being handled in rain; by lying wet, they soon become entirely useless.—Almost every person knows that they can be kept longer in summer, than is commonly done, nay even from one season to another, by being laid in a cool place, on an earthen or stone floor, and frequently turned.

It was not uncommon to distil a spirit from potatoes, in the highlands, before private families were prohibited, by the excise laws, to distil for their own use. A little malt was added to the mash of potatoes, in order to excite a fermentation: and the spirit drawn from this composition was by

no

* This process restores also the quality of other frosted roots and vegetables.

no means unpleasant. The process was simple; but as the law has forbidden its being put in practice, it is unnecessary to descend to particulars.

Potatoes were imported from America by Sir Walter Raleigh, in Queen Elizabeth's reign; were first planted in the fields by the Irish; were long confined to the garden by the British, and cultivated only as an article of luxury, for the wealthy. About sixty years ago, they found their way into the open fields, among us, as a national blessing; and their cultivation has been rapidly increasing ever since.

Turnips.

Large fields of turnips, cabbages, and greens are cultivated in almost every part of this county, but more so in some districts than in others. On all the land, except clay, where a proper rotation is observed, turnips and potatoes in various proportions, are substituted very sensibly for a fallow. Even in Glenerachd and Glengarry, which are the wildest and highest inhabited land of the whole shire, you meet with fields of drilled turnips, grown to a large size. On the clay land, although it be fit for turnips, when reduced to a fine tilth, the farmers have hitherto used, for the most part, a clean fallow; which has prevented, in some measure, the sowing of turnips; pease and beans being their cleaning crop.

Wherever turnips and potatoes are grown plentifully, there can be no scarcity. They are such an excellent substitute for meal, that in most cases they serve the same purpose, in the article of bread, and are relished for being highly palatable and nutritious. The latter is indeed more farinaceous, but the former has more sugar. The red topt stand against the severity of winter, better than the green, because the bulb is more below the earth; but the green is
less

less stringy and more delicious. Had turnips been cultivated in the year 1795, as extensively in the Highland districts, as the potatoes were, the succeeding summer of 1796, would not have occasioned such alarm, by the apprehension of a scarcity. Even as matters stood, the common people in the Highlands lived mostly on potatoes, dressed in various ways; and did send a supply of meal to the Lowlands.

The land, intended for a crop of turnips, ought to be well pulverized. For this purpose a rousing furrow should be given to it, and the rough stubble turned down, in the autumn; a second furrow, when winter is past, a third in May, and the turnip seed drilled in about the middle of June (for they ought never to be sown in broad cast). I would recommend to put down the dung with the first furrow, for a reason to be given afterwards: and the lime ought to be laid on the surface of the ground, immediately before sowing, and raked into the drills along with the seed.

The culture of turnips in the open fields was introduced into the west end of Strathearn by the late Sir Patrick Murray of Auchtertyre, about half a century ago; into the east end, by the late Mr Oliphant of Rossie, about the same period; into Monteath by the late Mr Drummond of Blairdrummond and Mr Ramsay of Ochtertyre; and even into Britain in George the 1's reign, by Lord Townshend, from Hanover.

The fly, which is the greatest enemy of turnips, is avoided in some cases, by sowing the seed of two different years together in the same field. The youngest or new seed springs first; and if the fly devours it, then it commonly takes its departure suddenly, which gives the oldest and late seed an opportunity of escaping its ravages. The half of the seed being steeped still further increases the difference of

the springing. The seed is so cheap, that a little more than ordinary may be used, in order to guard against the risk of losing the turnip crop: and the late seed comes on faster, than if the field were to be sown a second time; which might otherwise be necessary. The Bath Society recommend, in case the fly attack the young turnips, before they set out their rough leaves (for afterwards there is no danger), to take branches of the common elder, and after bruising the leaves, to fumigate them with the smoke of tobacco and *assa-fœtida*. These drawn gently over the plants, will relieve them from the vermin. Or the boughs of elder with the berries on may be drawn along the drills, as an antidote, before the turnips are sown. What I alluded to above is, that turnips have been often saved from the fly by ploughing down the dung the preceding autumn; and I never saw turnips destroyed by vermin that were sown with lime.

If the caterpillar attacks them in any stage of their growth; a few hungry poultry, turned into the field in a morning, will soon relieve them from that foe.

They are best weeded by the hand, and the most vigorous plants left standing at the distance of ten or twelve inches from one another. Afterwards they are horse-hoed, as often as appears necessary, first by taking the earth from the plants, and then by returning it to the roots, to give a supply of fresh mould; making the plough to go always in alternate alleys, which saves time and is better for the turnips. Every successive ploughing ought to be reversed from the former.

Turnips succeed best on a dry, friable mould: and in such situations, the land is greatly meliorated by feeding them off on the field. Sheep may be confined in *lurales* and removed occasionally. But where the soil is wet, the turnips must

be

be carried off the field, otherways the land will be poached, battered so much as to lose all the previous tilth by hoeing, and rendered more difficult to be ploughed: and if they are not carried off before winter, in some soils, the travelling of horses with carts is apt not only to poach the land, but the frost may be so severe, that the turnips cannot be got up. To preserve turnips from frost and save the expence of carrying them farther than is necessary, let them be piled up in a dry corner of the field, in conical heaps, before Christmas, that they may receive no injury from the frost, which generally sets in severe at that time; and if they are eaten in shades, fixed or moveable, the expence of carriage is, in a great measure, saved. The conical heaps may be made in this manner. Cut off the leaves and tap-roots of the turnips; spread some straw-litter in the bottom of the heap; upon this put a layer or course of turnips, two feet thick, less or more according to the length of the straw; then turn up the outer ends of the straw, to prevent the turnips from slipping off; give another course of straw and a course of turnips alternately, putting in the straw always as at first, till your heap end in a point. Cover the top with some straw, which with the straw below will thatch the whole.

Cattle ought to be fed with turnips, in the stall, for the sake of the dung, rather than in the fields, where the dung is dropt unequally and capriciously; in which case, it is of the utmost consequence to keep them clean. For this purpose, I have seen the settles of the byre (cow-house) sometimes floored. Rafters are laid across the byre, and covered with deals, in the same direction with the animal's body, at the distance of half an inch asunder, to let the urine drop through, and about four inches from the ground.

When turnips are used for feeding milch cows, persons of

a nice palate loathe the milk on account of a by-taste, which the turnips give it. Custom will, however, reconcile most people to this taste. Some of our tastes are acquired. At any rate, this peculiar taste would be less perceptible, if all the rotten leaves and all the injured turnips were carefully separated from what are sound, and given to the dry cattle; and if the turnip-taste remains in any sensible degree, after this precaution, it may be removed completely by putting a little weak solution of nitre into the milk.

Instead of raising turnips for a winter food, to fatten cattle, it might perhaps be more profitable, to allot them for a spring food, especially in countries, where there are great flocks of sheep. Tame sheep eat turnips greedily; and notwithstanding the reluctance which wild sheep sometimes discover, there is little doubt, but they may be brought to relish this food if accustomed to it when young, or confined either till hunger compelled them once to try it, or some sheep accustomed to that food put in along with the hill sheep. In the spring, dry provender is often scarce, and sheep are allowed to fall off, whereby they become so feeble as not to be able to bring forth their lambs; which was the universal complaint in spring 1793: or if nature should enable them to survive that crisis, they have so little milk, while pinched with hunger, that the lambs die in hundreds, for want of nourishment.

Swedish turnips, which are found to stand the most severe winters, without being injured, may serve this purpose: and the method of raising them to maturity is so accurately pointed out by the President of the Board of Agriculture, in his Report of the northern counties of Scotland, that I need only refer to his account of their cultivation. Green food in spring may be also procured by sowing rye in the autumn

or

or by sowing successive crops of the common red-top field turnips, at considerable intervals, for the space of six or eight weeks, after the ordinary season. The frost will not destroy these, which are half grown, so readily as those which have arrived at their full maturity. Next to the Swedish, the small yellow turnip stands frost best.

If sheep do not stand in need of this supply, owing to the mildness of the season, or if sheep are not the principal stock of the farm, they may be given to cattle, which, being allowed to go about in the open fields, eating their turnips and provender in shades, will become much sooner fat, on the next summer's grass; because otherways they would not eat their dry food with appetite, after the state of the air and the smell of rising vegetation, would render them impatient to roam at large. All animals, changing suddenly from dry food to new grass, take some time before they can be seasoned, and often become lean, by scouring; besides, that they can ill bear the piercing cold of spring nights, to which they must be frequently exposed, in this variable climate.

Rye.

THIS grain is cultivated in such small patches, although it be generally met with in every district of the county, that were it not for two circumstances, it might be improper to class it with the crops cultivated in this part of Scotland. It is sown at the same time with oats, wherever it is cultivated in the Highlands, and ripens along with them. The ends of the ridges next to the farm-stedding would be destroyed by the poultry, unless they were sown with this grain. The meal of it is seldom made into bread by the inhabitants of these districts; they use it mostly in spoon-food.

I see by my report of the agriculture of Strathearn in the
year

year 1701, that winter rye was sown on oat stubble in the farm of Auchtertyre, the latter end of autumn, to be converted into spring food for ewes and lambs; and that it was proposed to have this crop of winter rye eaten up in time to sow turnips or rape-feed the succeeding spring.

SECT. V. *Crops not commonly cultivated.*

BY paying attention to the climate and to the nature of the soil, it is no difficult matter to discern what species of crops ought to be introduced into any country. There is little doubt that the advice and example of many of the proprietors, who are eminent improvers, together with the practice of the most successful of the farmers, will in a short time overcome the prejudices of the most obstinate of the tenantry, and introduce into this county the culture of every valuable plant, known in any part of Britain, which is suited to the local circumstances of the different districts. It becomes the proprietors, by reason of their wealth and superior knowledge, to set the example; the most intelligent of the tenantry, by a little persuasion, will follow their footsteps, and the crowd will fall in of course—Man is an imitative creature. To this principle we owe many of our attainments. To it we may owe our knowledge and progress in agriculture.—It is not long since the common class of tenants were strongly prejudiced against all sown grasses, against turnips, and even against the potatoe, which next to corn is the greatest blessing in the article of vegetable food, that this part of the kingdom ever did enjoy.

The great point in all new improvements, which the common people are prone to stigmatize with the title of innovations, is, once to prevail with them to begin with the most valuable of the new plants, and to cultivate some of these at first

first upon a small scale. Every thing depends upon success in the first essays. Wherever strong prejudice is on the side of old habits, perseverance is not to be expected, without steadiness in prosecuting what is new.

Carrots and Parsnips.

THESE roots have been cultivated in the field very sparingly. I have not observed any extent of ground under carrots in all the county, except in Mr Stirling of Kier's inclosures. The carrot requires a deep free soil, and is very nutritious to all kinds of beasts. Parsnips require the same culture.

Mangel Wurzel, or the Root of Scarcity.

THIS plant is nearly allied to the Beet; the same kind of soil and the same culture are proper in both. It is sown in the seed-bed in March or April, and when the plants are of the size of a goose-quill, they are transplanted into drills by the dibble, about eighteen inches from one another every way, of the same size and in the same manner as the Swedish turnips are planted out from the seed-bed. I have seen none of it in this part of the country, except what was planted by myself, in the garden some years ago. It seemed to be exceedingly hardy, and much relished by horses and cows; but has not fulfilled the expectations of the public, which were perhaps too sanguine.

Rape-feed.

THIS plant is cultivated much less than it deserves. The ground is prepared for rape or cole-feed, in the same manner as for a crop of turnips; and both are sown about the same time. The rape is so hardy as not to be destroyed by frost; and therefore is of great service in hard winters for feeding

feeding sheep. When turnips are locked into the ground by frost, the rape may be cut off for a supply, and the stems shooting again early in the spring will produce a second crop, which may be either eaten green, if there be scarcity of spring food, or allowed to run to seed, which may be sold to advantage and bruised for extracting the oil. A gentleman in this neighbourhood, whom I shall have occasion to mention as a great improver of waste lands, sows a crop of cole-seed sometimes on mossy ground.

Sain-foin.

A SINGLE instance has not occurred in all the county of the cultivation of this plant; and therefore this article shall be devoted to a judicious observation of Mr William Dann of Gillingham, upon my former survey, that it may attract the public attention. "As I have seen no account of the cultivation of sain-foin in any part of Scotland; I would recommend it to be tried on some of the light soil mentioned in the Report of the County of Perth. Probably it might answer to be sown on ground that is inclosed, where the under stratum is either chalk or gravel: and if cultivated, I also recommend, that it be cut, *when in the height of bloom*; that afterwards no cattle be put on the ground *until the latter end of September*; and that it be not pastured after December."

Rhubarb.

THIS plant grows luxuriantly in the climate of Perthshire; and owing to the great profit, which it is calculated to bring, it is surprising that the culture of rhubarb has not claimed more attention and been adopted on a more extensive scale. Gardeners and others raise it to great perfection; and there is a constant demand for it as a medicine. The present Duke
of

Athol some years ago cultivated the greatest quantity ever known in this county — There is such a rage for every thing that is foreign, that rhubarb of Scottish growth is generally rejected in the shops, knowing it to be such: which may have prevented its cultivation.

Tobacco.

THE culture of tobacco was introduced into this neighbourhood, and probably into other parts of the county, during the latter end of the war with America. It became so dear, when our trade with that country was interrupted, that we resolved to try what could be done to supply our demands, by raising it at home.—The habit of using tobacco is like all our other luxurious gratifications, which become more inveterate by indulgence, while the pleasure arising from the sensations they afford, is diminishing every day. I raised tobacco about that period eighteen inches long in the leaf, and twelve inches broad. But an act of parliament, prohibiting its cultivation, soon put an end to all our experiments relative to this plant.

Tares.

TARES are cultivated successfully upon almost any soil. If sown in autumn, they make an excellent green food for sheep in the Spring; if sown early in Spring, they are a hearty feeding for horses between the first and second cuttings of the clover, which may be needed, when a severe drought retards the after math of clover; and if ploughed in, when most luxuriant, they afford an excellent manure, to prepare the ground for another crop. In this county little attention has been paid to tares, less perhaps than they deserve, because they spring earlier than any other plant we

have, stand the winter well, grow to a great length, are always green and succulent, and are well calculated for spring feeding.

Buck-wheat.

THIS plant has been also cultivated in the county of Perth, particularly by the late Colin Campbell, Esq. of Carwhin, on his estate of Edinample; but the cultivation of it is by no means general, although milch cows fed with it will yield an extraordinary quantity of milk, uncommonly good for making butter and cheese; and if allowed to come to maturity, the grain is a rich feeding for hogs and poultry.

Liquorice, Chicory, Madder, and the other plants, of the culture of which I have neither heard nor seen an instance in this country, are not to be taken any notice of.

I REQUEST the indulgence of the reader, while I make a few observations on the situation of the crop, during my tour in the latter end of autumn 1795; and while I step aside to give a few directions to the inhabitants of the Highland districts, relative to a better mode of cropping their land. These are thrown in at the end of this chapter, because they might seem to interrupt the connection between the subjects that went before.

The different operations of husbandry, both in the spring and autumn, are so much regulated by the season, and the seasons are so variable in this climate, that it is impossible to treat of these matters with absolute precision. It has been remarked above, that an industrious farmer will seize the proper opportunity, although a little earlier than the ordinary season of sowing, and wait patiently for that opportunity,

nity, although a little later. It is always safest however to be rather soon than late, if the ground be dry, well sheltered, and of a southern aspect.

The reaping season for the several crops has been, for the most part taken notice of, in the preceding account of each crop. In most parts of this country, it commences in the end of August, is general in September, and if the weather be tolerable, is finished in October. In high exposed situations, or where the farmers are so slovenly and stubborn in spring, as not to sow their grain, in proper time; and even so inattentive, as to leave their crop too long in the fields, after it is cut down, the harvest is often later.

Mr Donaldson says, that in place of mentioning the periods at which harvest commences, and is finished in the Carse of Gowrie, or the return from the various species of crops, he judged it more correct to state them in separate tables, taken from the journals of a particular farm: And I refer the more readily to these tables, because of the opinion I have of Mr Donaldson's accuracy, who resided for some years in the Carse, and because these dates and prices correspond with my own notes, relative to similar districts of the country. See his Report, p. 17, 18.

TABLE OF HARVESTING DIFFERENT KINDS OF GRAIN FROM
1788 TO 1793.

Years.	Wheat.	Spring Corn.	Barley.	Harvest commenced.	do. finished reaping.
1788	11 Sept.	7 April	6 May	25 Aug.	16 Sept.
1789	11 ditto	6 ditto	9 ditto	27 ditto	19 ditto
1790	13 ditto	3 March	6 ditto	27 ditto	19 ditto
1791	14 ditto	7 ditto	4 ditto	18 ditto	10 ditto
1792	4 Oct.	9 April	7 ditto	29 ditto	23 ditto
1793	10 Sept.	25 March	3 ditto	28 ditto	26 ditto

AVERAGE

HARVESTING.

AVERAGE PRODUCE PER ACRE, OF EACH SPECIES OF CROP, ON A FARM IN THE CARE OF GOWRIE, FOR SIX YEARS, COMMENCING WITH CROP 1787, AND INCLUDING CROP 1792; AND ALSO THE AVERAGE PRICES AT WHICH THEY WERE SOLD IN EACH OF THESE YEARS.

Crops.	Wheat.			Barley.			Oats.			Peas and Beans.			Early Peas.			Total.
In years.	Average produce per acre.	Average price per boll.	Average price per acre.	Average produce per acre.	Average price per boll.	Average price per acre.	Average produce per acre.	Average price per boll.	Average price per acre.	Average produce per acre.	Average price per boll.	Average price per acre.	Average produce per acre.	Average price per boll.	Average price per acre.	Average of grain.
1787	B. 6	F. 3	P. 0	L. 1	S. 2	D. 1 $\frac{3}{4}$	B. 6	F. 3	P. 0 $\frac{1}{4}$	L. 0	S. 14	D. 5 $\frac{1}{4}$	B. 9	F. 0	P. 0 $\frac{1}{4}$	1 $\frac{1}{2}$
1788	7	1	0 $\frac{1}{2}$	1	10 $\frac{1}{4}$	9	3	3	3 $\frac{1}{4}$	0	13	2	11	2	0 $\frac{1}{2}$	1 $\frac{1}{2}$
1789	9	1	0 $\frac{1}{2}$	1	6 $\frac{1}{4}$	6	3	3	3 $\frac{1}{2}$	0	16	8	9	1	0 $\frac{1}{2}$	1 $\frac{1}{2}$
1790	6	3	0 $\frac{1}{4}$	1	2	1 $\frac{1}{2}$	1	1	0 $\frac{1}{2}$	0	15	5	11	1	0 $\frac{1}{2}$	1
1791	7	3	0 $\frac{1}{4}$	1	7 $\frac{1}{2}$	10	1	0	0	0	18	0 $\frac{1}{4}$	10	0	3	0
1792	7	2	3 $\frac{1}{2}$	1	2	0 $\frac{1}{2}$	5	1	0	0	19	6 $\frac{1}{4}$	8	0	0	1 $\frac{1}{2}$
Div. by 6.	45	2	1	6	12	4	47	2	2 $\frac{1}{2}$	4	17	3 $\frac{1}{2}$	9	1	1 $\frac{1}{4}$	0 $\frac{1}{2}$
Gr. Ave.	7	2	1 $\frac{1}{2}$	2	0 $\frac{3}{4}$	7	3	3	0	16	2 $\frac{1}{2}$	9	3	2 $\frac{1}{4}$	0	1 $\frac{1}{2}$

Potatoes.

Potatoes.			Hay.			Flax.		
Average produce per measured boll			Average price per boll	Average produce per acre.	Average price per stone	Average produce per acre.	Average price per stone.	
B.	F.	P.	L. S. D.	Stone.	L. S. D.	Stone.	L. S. D.	
54	1	0	not stated	200	0 0 6	13	0 12 0	
75	2	0	0 4 8 $\frac{1}{2}$	100	0 0 5	16	0 12 0	
62	0	0	0 4 7 $\frac{1}{2}$	266	0 0 7	26 $\frac{1}{4}$	0 12 0	
48	0	0	0 6 0	83	0 0 6	18 $\frac{1}{4}$	0 12 0	
70	0	0	0 4 2 $\frac{1}{2}$	200	0 0 6 $\frac{1}{4}$	13 $\frac{1}{2}$	0 12 0	
53	0	0	0 8 1 $\frac{1}{2}$	187	0 1 0	34 $\frac{1}{2}$	0 12 0	
362	3	0	7 7 $\frac{1}{2}$	1036	0 3 6 $\frac{1}{4}$	121 $\frac{1}{2}$	3 12 0	
60	2	0	5 6 $\frac{3}{4}$	172 $\frac{2}{3}$	0 0 7	20 $\frac{1}{4}$	0 12 0	

N. B. It should be remarked here, that the above average return from the acre is upon a farm not under a regular rotation of cropping, and therefore the general average of the crops is considerably less than it would have been, had the farm been cropped in six parts, as formerly mentioned.

The boll of wheat weighs fourteen stone Amsterdam ; barley, eighteen stone ; oats, from fourteen stone to fourteen stone and a half ; and pease and beans, from thirteen to fourteen stone.

In October 1795, when I travelled over the most distant corners of this county, to explore such places as I had not visited in 1793, the situation of the crop was deplorable beyond description. Wheat, barley, oats, pease, and beans, in very many places, lying like a common wreck :—the bands and head-sheaves growing and become green, like new spring clover, all matted together ; and the under sheaves, where they had not been bleached with the storm, of a black and rotten appearance. In the fertile vale of Athol, scarcely a ridge was cleared, and yet very few remained uncut down. In Breadalbane there was more to reap, but there was more saved. In the low countries there was very little to cut down, but a great deal in the fields, exposed to all the injuries of the weather.

This devastation was, no doubt, in a great measure, (but I fear, not altogether,) occasioned by the rainy season. Late sowing prognosticates late reaping ; and continuing to shear, when one ought to be gathering the crop, is always a fatal error in harvest ; especially where the climate is so variable as ours. There were that very autumn, two or three weeks, in the latter end of September, without a shower. This tract of fair weather, it is presumed, was general. In some parts of the county, this favourable juncture was seized, and every sheaf was got together without a drop of rain. The operations of the field went on night and day, almost without intermission. And many farmers about Callander had their harvest-work closed, by the 24th of September.

Where reapers cannot be got, where farms are very extensive, and the crop of various kinds, longer time is required to complete the labours of harvest, than otherways. Yet as there is no instruction equal to a lesson of experience, it is hoped, that the harvest 1795, will be long remembered

in

in the tract under review, and that the damage then sustained, whether it was unavoidable or not, will teach some of the farmers to sow their grain earlier; will teach them all to exert every nerve, at that critical season, to collect their corns, whenever they will keep; not to neglect an opportunity of gathering a little, unless much be won; in no case to reap when they ought to be leading in (housing) their grain; and not for a moment to lose sight of the principal operation, which crowns the labours of the whole year. It is not uncommon at this season to have frost and some wind at night, and a drizzling calm rain by day. I have known the active in such circumstances, save their crop, while the indolent were asleep.

In the highland districts of this country, the reapers cut low, level, and clean, to a degree almost unknown in any other country. This practice I observed with pleasure, in Athol, Breadalbane, and the adjacent districts. This practice I earnestly recommend. Low shearing produces additional provender, and if all the straw is not required for the purpose of food, cattle will reject the coarse, which serves for litter, and being trodden under their feet, makes an increase of dung; whereas if it be left in the field, by means of high shearing, you have less litter and less dung. If a long stubble were to be ploughed in before winter, it might do good to the soil, but after it is bleached with wind and rain, and corroded with frost, all its juices, all its manuring virtues, are in a great measure lost.—The gentlemen, who surveyed the west riding of Yorkshire, have set this matter in the clearest point of view, by the very able and judicious report they have given of the husbandry of that country.

Mention

Mention was made above of the different ways in which grain is set up in the fields to winn, and how the stacks are commonly built. I saw also a very ingenious farmer build his corn stacks in the form of little houses, upon pillars that went round his straw yard, where he meant to feed his out-lying cattle. A solid wall of sufficient mason-work formed the outside, and the pillars went round the inside of the straw-yard. Beams of a proper length were first laid from one pillar to another, and rafters were laid across from the wall to the pillars, by way of flooring; upon which the stacks were built of any length and height that was necessary; their roofs being neatly thatched and secured with ropes. The cattle below are protected from the snow and rain, the grain is preserved from dampness and vermin, and the farmer saves every particle of manure.

Thistles and the larger weeds are taken from the oats and barley when they are in the shot blade, by means of a long wooden forceps; which is very much used in the Highlands. A man walks through the corn with his shoes and stockings off, and nips up the larger weeds from the root: but where the land has not lain for some time in grass, or has not been occasionally cleaned by a fallow crop, a great number of small weeds escape notice at this season, and infest the ground from year to year. This evil prevails most, where large slices of the land are left unploughed, as boundaries between the alternate ridges of neighbours, in the same plough-gate; which are a perpetual nursery of weeds, besides the loss of so much land lying waste. These earthen boundaries (baulks) are wearing fast out, in this country; and it is to be hoped will soon disappear.

IN a considerable proportion of the county, especially towards the Highlands, the common class of farmers are only beginning to turn their thoughts towards a proper rotation in cropping their land, and to the cultivation of some very useful plants, which have, for some time, been introduced into the system observed in the lower districts. I hope therefore to be forgiven, by the intelligent farmer, (who may pass over the following digression) while I step aside a little to give a few plain directions to my friends in the Highlands of Perthshire, to most of whom I have the honour to be known, and from whom I trust, I have the credit, that I shall only direct them, according to the best of my judgment to what is conducive to their interest.

Without the concurrence of the proprietors and of their factors, neither the following improvements, nor any other, can succeed: but where the gentlemen are so much enlightened, and the common people so acute, there is the most sanguine hope, that the tenantry will listen to advice and prosecute their own emolument. And if a few in either class are still of so little discernment, as slavishly and blindly to persevere in following the husbandry of the last century; these are certainly so few in number, that the improving practice of others, on all hands around them, will soon put them out of countenance.

Upon every plough gate of land, a field ought to be enclosed, not less than six acres of ground; if it be nine or twelve, so much the better; and if the land be so much broken, that this number of acres cannot be got contiguous, let them be inclosed where they can be got.

1. Let one sixth, being the poorest of the land, be allotted, the first year, for potatoes and turnips, planted in drills. The method of managing potatoes is well under-

stood; turnips are as easily managed, only that they require to be frequently thinned, unless they be completely thinned at first.

2. Against the second year of your rotation, let barley and grafs-seeds be sown after the potatoes and turnips, giving the land a sprinkling of dung. Sow one-third less barley than ordinary, when grafs-seeds are intermixed. After the barley is harrowed, and the stones and weeds and roots of grafs taken off, sow sixteen pounds of red clover and two or three bushels of rye-grafs, one after another, upon the acre. Harrow these with a bush of birch or some other wood, that has a smooth top and many branches, fixed in the harrow; but beware of the harrow edging to one side, and making furrows in the ground. Over all, in a calm day, throw some lime finely flaked and equally spread. A second bush harrowing with the lime completes the operations, unless you have a roller.—That same year, plant another sixth of your inclosed land with potatoes and turnips.

3. The third year of your rotation, sow barley, clover, and rye-grafs, after your fallow crop as formerly. Plant potatoes and turnips in your third division. Cut down your hay, when the first flowers of your clover begin to turn brown, and the rye-grafs to become yellow at the root. Draw out some of your rye-grafs from the swath; tie it in sheaves, and set it up to dry in stooks, without heads, till it be fit for thrashing. In the mean time, after your hay has lain two or three days in the swath, turn it with a rake or fork in a fine forenoon, and after tedding and turning it once or twice, put it up in small cocks in the evening, never to be spread more, unless the weather be very unfavourable. The second or third day thereafter, if there has been

no rain, you may put every two cocks into one, making the tops of every two old cocks the bottom of a new one. By this time, the hay ought to be in a condition to resist some rain, without being spoilt. In the mean time you thrash your rye-grafs, and clean the feed from the chaff. Take out the clover leaves and the stumps of grafs with a corn sieve (or riddle). The rye-grafs ought to be shaken from the flail, and mixed with the rest of your hay. By joining two or three of your ricks together a second time, it is unnecessary to stir it any more, till you put it up in the tramp rick. When the second crop of clover begins to carry flowers, you may begin to cut it for house-feeding to the cows or horses, as you have occasion.

4. In the fourth year of the rotation, you go on as formerly, planting a new division with roots, sowing barley and grafs seeds after your last fallow crop, reaping the hay and saving a necessary quantity of rye-grafs seed for your own use: and from the lot, which was under hay the last year, you may either make hay this year, if the appearance be promising in May, or consume it in pasture. If it be in pasture, and your land not subdivided, you may tedder a beast, especially a milch cow to eat up the grafs.

5. Against the fifth year of the rotation, you fallow a new division with turnips and potatoes; and go on with the rest as formerly directed. This season you have two divisions in pasture and one in hay. In your pasture I would recommend to spread the dung that is dropt on the ground, once a week or every two weeks at farthest, otherways much of the grafs will be kept down, and the manure will not be equally divided.

6. The last year of the rotation, you fallow the remaining lot, and you have also barley, hay, and two lots for pas-

ture, and in the oldest division of your pasture you sow oats ; which completes the rotation. Having thus established your rotation, you may follow it regularly for the future years of your lease, having 1. Turnips and potatoes, 2. Barley with grass-seeds, 3. Hay, 4. Pasture, 5. Pasture, 6. Oats.

This method of cropping gives a cleaning to your land once in six years, to free it of weeds, and two years to rest the ground and recruit its strength, while at the same time, it is receiving an addition of manure. Your pasture will rise early in spring, to support your beasts when provender is scarce, and the natural grass scanty. You have the weedings of your turnips for house-feeding, before the second crop of clover is ready, after the hay is cut ; you have this second crop of clover through the autumn, to bait your cows at mid-day and at night, which will increase and enrich their milk, or it may assist in feeding your horses. But if not required for either of these purposes, you may allow it to ripen, and when your earliest barley is ready, by mixing it with the barley straw, it may be stacked up, and will make good provender for the winter. Your turnips will feed your cows about Martinmas, when the pasture in the open fields shall fail, which will afford plenty of milk, or fatten well, with a little dry provender given occasionally ; and your division of hay will produce more and better food to your beasts than three times as much ground under straw or the ordinary sort of meadow.

Upon all light land in the Highlands this is the most profitable method of cropping. It is equally beneficial to the proprietor and tenant. The land is kept constantly in good order. The possessor reaps the full benefit of his ground
every

every year, and at the end of the lease it is in proper condition.

Where the soil is naturally rich, the only deviations from this rotation, that can be adopted with any degree of safety, are ; either to have the land in five divisions, and only one year in pasture ; or to have the land in seven divisions, with two crops of oats successively and two years of pasture ; or while the land is in fixes, as first mentioned, to have two crops of oats, and only one year in pasture ; but very few kinds of soil in the Highlands can, without injury, stand this last mode of cropping, unless some manure be laid on the green sward, previous to the first crop of oats. I approve of none of these deviations.

The plan now proposed is only a first essay to those, who are willing to introduce and make trial of an improved method of farming. But whenever six or more acres are gone over and the rotation completed, a whole inclosure may be cropped according to what is recommended with each of these small lots. If the farm consist of more inclosures than six, the same rotation may be followed in two places at once, or each field may be more years in pasture. The size of inclosures ought in all cases, to be regulated by the extent of the farm ; even the length of twelve acres in each, on great farms.

If proprietors study their own interest and that of their tenants, they will give leases of such a duration, as will encourage the tenants to cultivate the ground in this or in some similar manner. They will either inclose land, upon which the farmer will observe the rotation, charging a certain interest for the money laid out, or engage to pay the tenant the value of his fences at the end of his lease.

If the farmers are not totally blind to their own interest,
they

they will never hesitate to become bound to have at least a small portion of their land brought into good order and rendered more productive, as a specimen of the cultivation, which would be proper, and which, it is hoped, will in process of time, be adopted upon all the arable land of their farms.

In many of the Highland estates bounding fences are already built around the arable ground of the several farms; in others there is only a head-dyke between the hills and green ground. Without entering on the discussion of that question, whether in the dawn of improvement, inclosing ought to begin, by making a bounding fence, that embraces the whole arable ground of a farm, or by making small inclosures upon a regular plan and in regular succession, of the land already in tillage; I would lay it down as a maxim, that an arable farm is never at its value, either to the proprietor or tenant, even although inclosed round, until the subdivisions are completed: and the sooner that one or more of these subdivisions are made and regularly cropped, the sooner will the propriety be seen and the benefit felt, of finishing the whole.

It cannot be questioned, that the proprietors of Highland estates have equal intelligence, equal spirit and an equal desire of doing good to their country, with those in the low lands; and if some of the farmers are behind their brethren, in the more fertile provinces of the low country, in respect of stock or the knowledge of cultivation; they are not behind them in spirit or discernment. Their want of stock can only be remedied by increasing industry and a superior improvement of their soil; and their knowledge of agriculture can only be increased, by listening to advice and by following that practice, which is justified by experience.

CHAP. VIII.

GRASS.

NATURE is the nurse of all plants. The ingenuity of man may vary them into different shapes, may reject one species and cultivate or even improve another ; but he must have the species at first put into his hand. Among all the plants we know, which are destined for the support of animal life, grass seems to be the favourite of nature, because it is the most universal. Browning animals are unable to rear food for themselves. If the industry of cultivation were requisite for their maintenance, they must perish: therefore the bounty of Providence is every hour cultivating food for them. Man has ingenuity and industry, therefore he is so far left to his shifts, that the plants, which he delights to live upon, require, in this climate at least, to be cultivated with attention and labour. His intelligence is exercised, and his industry required to provide sustenance suited to his nature. By the sweat of his face he must eat his bread. In all civilized nations this economy is observable ; and it scarcely forms an exception, that among savage tribes, man lives mostly upon browning animals ; and these upon spontaneous grass. In this case, grass ultimately constitutes the basis of human food, because it is the food of those beasts on whose flesh mankind live ; and man being unable to live immediately on grass, it is concocted for him and prepared for his food, by being changed into living creatures, through the kindness of Providence. But being, by the formation of his teeth and other parts of his body,

more

more a granivorous than a carnivorous creature ; so soon as he rises to his own rank in the scale of nature, society is established, the wants of men increase, and in place of the scanty, precarious supply, arising from animal food alone, the fields are cultivated, labour is employed, grain is raised, and abundance smiles on all the land.

SECT. I. *Meadows and Pastures.*

IN the county of Perth, which abounds in lakes and rivers, it is natural to expect a considerable proportion of marshy, soft land, unfit for tillage. This is the most common designation of meadow in this country ; it is perhaps more proper to name all land, from which hay is taken, meadow. Where there is a fall, drains have been made, the soil laid dry, and very abundant crops raised ; but in situations, where draining is difficult, or impracticable, the ground has been employed in meadows or pastures, which are more or less productive, according to the quality of the soil and the quantity of its moisture.

These meadows are most frequent at the upper end of lakes, where the principal river that feeds the lake, has been carrying down soil and other loose materials for ages, increasing on its dimensions every year, and forming a gradual addition to the solid land. The brooks also which descend from glens situated on the sides of lakes, have in course of time, carried down the stones, gravel, and soil of these glens, into the lakes, forming triangular promontories of very rich land, more or less extensive, according to the weight of water, which is the cause *. The larger brooks likewise, which

* Similar to this is the cause of the production of carse or clay land in the Friths of Scotland, and probably every where else. Rivers, flowing

which fall at right angles into rivers, whose banks are not very high, and whose course is not very rapid, in many in-

D d

stances

flowing thro' tracts of rich land, become muddy when they happen to be swelled with rain, and carry down a great quantity of the soil. The coarse materials are all deposited in the first still water; the finer particles have so little specific gravity, above that of water, that they are carried along, while the least degree of current remains: and their fineness, or if you will, their richness is in every case proportionable to the length of their course, the slowness of their motion, and the nature of the soil, from which they are brought. The finest always go farthest. When rivers in this state disembogue themselves into an arm of the sea, their current is totally stopt; and every particle of sediment they contain, subsides. This constant accumulation of soil, since the beginning of time, or at least since the deluge, has been gaining on the sea, and forming tracts of the finest cohesive soil. If the soil of the back ground be pale till, the new land partakes of that colour; if it be red till, or loam, or mossy, the case is tinged with these shades. Even the poorest back ground will form case of considerable fertility, because nothing is carried to the tide-way, except the richest part of the soil. But such rivers as are here alluded to, generally take their course in large vallies of the richest mould.

Hence it follows, that the clay land next the sea is naturally the most productive; but the comparative barrenness of the more remote cases is corrected by the long action of tillage and the addition of manure, ever since they were reclaimed.

Where these rivers overflow their banks, before they arrive at the sea, they deposite fine earth, but not the finest of their treasures. In such situations they form haughs, which are more or less fertile, in proportion to the stillness of the river, with which they are inundated.

The sediment of water forms argillaceous earth. The deciduous parts of plants and the exuvie of animals compose calcareous earth. The natural richness of the latter depends on the species of plants, which in a state of decomposition have in the course of time entered into its substance, and on the quantity of the spoils of animals it has received: But these original qualities of soil would lead into a disquisition

stances, choak the course of these rivers and throw back the water, forming temporary lakes or morasses, and render the adjacent land unfit for tillage. In all these cases the heavier materials sink deepest, while the finer particles of the soil are deposited on the surface. Hence the natural cause of the extreme fertility of some meadows.

In all countries, where there are many vallies, and their declination small and the rivers flowing smoothly, meadows are frequent : and in the inland districts of this county, there is such an extent of this kind of ground, that it might appear tedious and uninteresting to descend to particular instances.

It must be confessed, that in many places, these meadows are very much neglected, where something might have been done, to render them more useful. They are overcharged with water a great part of the year. The grass is coarse, unpalatable to cattle and unfit for hay. Little or nothing grows, except rushes, flags, willows, and other aquatic plants. In many parts of the county the meadows are abandoned as incurable, where some cultivation seems to be applied to the arable ground. There are other instances, where industry has turned its attention to this species of cultivation. Willows, allers, and other brush-wood are grubbed up; and the hillocks that grow about their roots by the accretion of mud, are shaved off, to enable the mower to pass his sythe over them with ease. In other places the superfluous moisture, wherewith the land was overcharged, is carried off by
draining

quifition, which to some readers might appear too long and to others not sufficiently interesting : yet whatever have been the primary qualities of any piece of land ; they are very much changed by cultivation, although never totally eradicated.

draining, where that improvement was practicable; and the finer species of meadow-grasses rising spontaneously occupy the room of flags and rushes.

Unless meadow ground can be laid dry, in such a manner, as to bring it under the plough, in a regular rotation of cropping, it ought, if possible, to be so far drained as to relieve it of superfluous moisture, which is unfriendly to the common meadow-grasses, and to be flooded occasionally with fresh water fraught with sediment. The sediment of calcareous earth is of all others the most fertilizing; but that of minerals will check vegetation. This is the highest improvement, of which that land is capable, and the cheapest manure it can receive. But it must not be flooded, when the grass is long and intended for hay, because the quality of the hay is lessened: There is a chance of some sand adhering to the stalks, which renders it injurious to cattle, and of the hay being so much warped, if the crop be heavy, that it becomes difficult to be mown. Neither ought a field to be flooded soon before cattle are let in upon it, when in pasture, because in this case, it would be liable to poaching: nor ought the water to remain long at once, especially in the warm season, because the water would gather a green scum, which lies down on grass, like a sheet, even after the water is discharged, and prevents vegetation, by excluding free air and the influence of the sun.

It is not only improper, in flooding meadows, to let the water remain upon them any longer, than till the sediment has wholly subsided; but attention should be paid, to bring in the water, when it is most muddy, which generally happens in the spring and autumn. In severe winters, the land is in danger of being too much chilled, especially if the water is locked in by frost; and in summer other unfavourable

circumstances already taken notice of may occur. Water, that has been strained, *i. e.* water which has already deposited its fertilizing particles on one meadow, is not so valuable a manure for another, as fresh water from the brook.

When the field is almost horizontal, or spouty all over, or the declination against draining it, I would advise laying it up in small ridges with the spade, in the form of potatoe lazy-beds, from six to ten feet in breadth, more or less, according to the swampiness of the ground, digging the trenches between the ridges of such depth, as may lay the ridges dry. If this be done in spring, a crop of potatoes may be got the same season; which will bring the ground into a fine tilth, for sowing grass-seeds and grain next season; or if the work be done in summer, it may be sown at any time with the seed of meadow-grasses. Of these the meadow fox-tail (*alopecurus pratensis*) and the rough stalked meadow-grass (*poa trivialis*) are most proper for wet seasons; and they do very well, when sown together, because the latter expands itself more than the former. The meadow fescue (*festuca pratensis*), and the sweet scented vernal grass (*anthoxanthum odoratum*), which also spread in different degrees, form a mixture for moist land. Smooth stalked meadow-grass (*poa pratensis*) and the crested dog-tail (*cynosurus cristatus*) are well adapted for dry pasture.

Besides these, there is a variety of other meadow-grasses some of which are valuable for being early, others for being hardy, others for bringing a weighty crop, and others for suiting the nature of different soils and climates. Whoever wishes to have his meadows in good order, must clear them of all obstructions to their being cut in hay or used for pasture.

In situations, where water cannot be commanded, some other manure ought to be laid on grafs grounds, which are intended for hay. Marle or lime or ashes will make an excellent top-dressing, where the soil is dry; but where it is moist, it will be more proper to use dung; and this dung ought not to be long or mixed with much litter, or newly made, bec use it will soon become parched, and the juices will be exhaled by the sun and wind, before its virtues are absorbed by the soil. Small dung, mixed with rich marle, is preferable.

The channels for conveying water to flooded meadows, should have such a gentle declination, that the force of the current may not carry stones or gravel, to choak the canals themselves, or carry that trumpery down on the flooded land. And the smaller channels, by which the water is divided and spread, ought to be made with the same precaution. The drains also for carrying it off, ought to be made in the same manner, that the water may retire slowly, without carrying any of the soil away, and as little as possible of the sediment.

Pastures in more elevated situations than those hitherto alluded to, are every where to be met with, in the Highland districts of this county. These consist partly of land exhausted by scourging crops, till the land can yield no more to the gripe of avarice, which then is left to go into spontaneous grafs. They consist also of green ground, which had never been reclaimed, in situations, which admit not of the operations of agriculture. It is to be hoped, that owing to the spirit of cultivation, which has gone forth, the period is not far distant, when all the arable land left in pasture, will be sown out with white clover and other grasses,
corresponding

corresponding to its nature, and that it will be enriched occasionally by water or some other fertilizing substance.

Many thousand acres, of the very best arable ground, both in this county, and in all the counties of the kingdom are lying in pasture, around the houses of wealthy proprietors, which have not carried an ear of corn for many years, and may continue indefinitely in the same style.—In fullen and solitary magnificence the owner sits alone, surrounded with sheep in place of men.

If the public have an interest in the lands of individuals and any right to enquire into the manner, in which they are occupied, and into the uses, to which they are applied, which, it is presumed, ought to be the case in every well regulated society, and under every government established on liberal principles, this practice of laying half a parish waste, should claim the cognizance of the legislature. On a small scale the injury to the public is not so hurtful, but when carried to excess, it requires but little penetration to discern that it is a national evil of the first magnitude, and every man must acknowledge its ruinous consequences, who esteems men to be preferable to sheep.

In many parts of Scotland, whole districts are laid waste; the inhabitants are chased away and nothing to be seen except enormous sheep farms. It beautifies a country to have well dressed lawns around the mansions of the great; nor is the injury to the community so hurtful, when these lawns are of moderate extent: but there is no apology, except avarice, for reducing large tracts of the country to a solitude by converting good arable ground into sheep farms of immense extent.

In the last year, 1796, while government gave a bounty for the importation of grain; while persons of all ranks were obli-
ged

ged to reduce the quantity and quality of their bread ; while the humane were either parochially or individually finding it necessary to purchase meal for the poor to keep them from starving ; while all distillation of grain was prohibited, under the most severe penalties, and the public lost the revenue arising from that branch of excise ; while these and other circumstances demonstrated the alarm, that had seized the public mind from an apprehension of scarcity, there was an extent of land lying unproductive of grain, which had been in tillage thirty or forty years ago, that would have produced grain more than sufficient to supply the defect, at the usual prices, without importation. An appeal to a single fact proves this, without any farther reasoning. Not a third part of these grass lands were broke up in spring 1796, and yet in 1797 when this crop came to market there was such plenty in the country, that the prices fell more than 50 per cent.

May not this evil be remedied, by ordaining that beyond a stated number of acres of grass ground, specified according to the circumstances and situation of different classes of men, every acre of arable land in the possession of any person, which shall not revert under the plough, in a certain number of years, shall pay a tax to government ; and that this tax shall either increase yearly, so long as this surplus of arable land shall continue in grass ; or that the tax be laid on, in the first instance, proportionally to the surplus, in a geometrical progression, according to the tenor of the tax on windows.

Few taxes can be proposed, which are not objectionable in some respect or other. Those are the most hurtful, which militate against the national prosperity ; whereas these laid on the luxuries of life are liable to fewest objections, in so far as many of them give bread to the industrious, and af-
fect

fect neither our population nor commerce. This tax may be objected to also, but no man can pretend to say, that it will either cut the sinews of industry, cramp our trade, send our money out of the country, grind the face of the poor or lessen the population. Nay, it would operate powerfully in an opposite direction, and must eventually contribute greatly to the common good.

In some of these reports and in other publications on this subject, it is maintained that the balance between grass and corn will find its own level, i. e. when corn rises to a high price, grass-lands will be ploughed; and when the price of grain is low, more land will return to grass. This reasoning is very common; but I doubt that it is more specious than solid. If the population were always stationary, the argument is conclusive. But population is both fluctuating and extremely delicate: as much so, as commerce. Duties may be so light as to encourage trade and enable it to increase; heavier burdens may restrict it so far as to become stationary; and burdens still heavier may diminish or annihilate it. Bread at a certain price may increase population; bread at a higher price may not diminish it, but only render it stationary; and bread at a price still higher may diminish or discourage it. Dearth or the want of bread therefore, although it should not diminish the population, may and certainly will retard its increase: and when causes, hostile to population, prevent its increase, the price of bread may be moderated by the want of that increased population, far below, what the price would have been, if these adverse causes had not existed, and the population had been cherished and allowed its full scope.—This subject requires attention; and every person who considers it maturely will see its force without my spending time in any illustration.—The population

of a country is not only affected in the manner alluded to, but by the comparative prices of the necessaries of life in that country and in those around it.

If manufactures continue to increase in this country, and the price of every article of food to rise, even with the population we have, the price of labour will become so enormous that we shall soon be underfold in every market: whereas, if food were kept tolerably cheap, at least as cheap as in our power, by turning arable land now in grass into corn-fields, and thereby rendering it more productive, both our manufactures and our population would increase, with rapidity; the price of labour of all kinds would be moderate, which nothing can effect but an increase of population; and our manufactured goods, after paying a reasonable duty to government, would, in every competition with foreign nations, be preferred in the market, both as to price and quality.

SECT. II. *Artificial Grasses.*

RYE grass and red clover are the artificial grasses most esteemed in this county. If the rotation admits of the grass lands lying a few years in pasture, there is commonly some white or yellow clover or rib-grass added, according to the preference which different farmers may give to either of these plants. The proportion in which they are mixed, when sown, is altogether arbitrary. When hay is the object, the rye-grass predominates; when the crop is to be cut for green food, there is always more red clover and less rye-grass.—It is worthy of being remarked, that the oftener red clover is cut green, without being allowed to carry seed, the longer it will last in the ground.

In most cases, the seeds of grass are sown with another

E c

crop

crop, commonly barley, in this county. Immediately after the barley is harrowed, the grass seeds are sown and covered with a brush-harrow; and afterwards the whole is rolled neatly down. Some farmers sow the grass seeds, when the other crop is a few inches high. An ingenious neighbour of mine recommends to sow the clover seed a week or two earlier than the rye grass, when they are to be in the same field; because the clover plants, having at first a very tender stem, and the rye-grass being apt to clasp around them, the former is often thereby either killed or stunted in the growth.

The best time for cutting clover is, when the flowers are all fully blown, and the earliest begin to turn brown. If allowed to stand longer, the roots of the stalks lose their leaves, and become hard and sticky; and the plant is so much exhausted, that it takes a long time before it send up new shoots.

When cows are fed on clover during summer, if the crop be luxuriant and the farmer understand his business, he does by no means allow them to go to pasture on the field. Although it be a little more trouble, he will find his account in cutting the clover and carrying it to the strawyard to feed his cattle. My reasons shall be mentioned in the Section upon feeding. This practice is followed by the farmers about the East bridge of Earn, and in other parts of the country, where rural economy is properly understood.

Persons skilled in the tendance of cattle fed on clover, advise not to let them remain long upon it at one time, until they are taught by instinct to know its effects, especially if the clover be wet; and withal to keep them in motion. Nevertheless, some of them may swell; in which event, let a chopin (two English pints) of new milk be poured into the belly

belly of any that are affected, by means of a horn; and if that does good, the dose ought to be repeated. But if the beast does not recover, let blood, and give it a puncture in the flank, at a distance from the intrails, put in a quill or some other tubular substance, to allow the wind to escape, and keep the animal in motion.

The first crop of sown grass is for the most part made into hay; yet a gentleman in Strathcarn, of superior knowledge in agriculture, recommends eating up the first year's crop by sheep, when rye-grass and white clover only are sown, and when it is intended that the land shall remain some considerable time in pasture. By this management, he promises from his own experience, a more abundant crop the subsequent years; because the grass is rendered thicker and stronger by the manure of the sheep and the superior number it can maintain.

In the last Section, which treats of meadows, mention was made of particular kinds of grass, naturally suited to different degrees of moisture in the soil. This may be the proper place to take notice of some other kinds, which may be cultivated successfully on a dry soil; and which will, no doubt, be cultivated, when agriculture is more improved, and the comparative value of the several grasses properly understood. There are two great classes of the culmiferous grasses; these, whose leaves wither, as the plants advance to perfection and carry seed: and these, whose leaves do not decay, but retain their verdure and their succulence, in similar circumstances. The last class without doubt is the most valuable; and even of them the fescue grasses excel the rest. The sheep's fescue grass (*festuca ovina*) excels all those of the same family. It is the sweetest to the taste of animals, the closest in the pile and the most verdant in

any unfavourable situations, of all the fescues. Its leaves which are so small and rounded in the edges, that they appear to be tubular, spring up in thick tufts; and new plants are set off on every side from the fibres, until all the intervals of vacant ground are filled up, and the whole surface becomes one close matted carpet of grass, as thick as it can stand.

Sain foin, lucern and burnet, as above mentioned, are not cultivated in this county; and when they come into repute, the farmers can have recourse to treatises upon agriculture, which give specific directions about their cultivation.

SECT. III. *Hay harvest.*

The great object in making hay is to preserve as much of the natural sap as possible. The proper time of cutting it therefore, is when the crop of grass has attained its highest degree of perfection; when the plants are in full blow, and before their flowers begin to fade. If cut too green, the hay shrivels and loses much of its bulk; if allowed to stand till the seeds are ripe, the stem becomes hard and wiry, the roots lose much of their natural sap, the after math is less abundant, and the principal part of the hay is in danger of crumbling away into short stumps, under the various operations which it must undergo. Better to be too soon than too late; especially if the crop be heavy and in danger of lodging.

When the saving of seed is the object, the clover or ryegrass or any other kind of grass is sown clean and unmixed. If the climate be favourable, the second cutting of clover will produce ripe seed; but in a northern latitude and variable climate, such as that of Scotland, it is much safer to take the first crop. In order to bring the crop equally forward

ward and make it produce the greatest quantity of seed, the red or white clover ought to be kept down till the middle of May, with sheep, and then left to come forward to its full maturity; which will make it about two weeks later than if it were intended for hay. The ripeness of the seed is known by rubbing it with the hand, and its parting freely from the husk. When cut down and carefully dried, the flail ought to be applied the first sunny day, to thrash out the seed: continuing to dry and thrash every bunch alternately, until no seed remain. The ripest and best seed drops first.

Rye-grass, when ripe, may be cut and bound up in sheaves, like corn, and thrashed out in the same manner. Where the rye-grass has been mixed with clover, the hay is sometimes thrashed out of the cocks; but it does less damage to the hay, to draw out the rye-grass from the swath, to bind it in sheaves, and when thoroughly winn, to thrash it out by itself.

In making hay of clover and rye-grass, some farmers advise to allow the hay to lie in the swath for two or three days; and after the superfluous moisture and dew are evaporated, in a dry day, either to ted it a little, or turn the swaths, and in the afternoon to make it up into small cocks, suitable to the state of the hay. The only objection to this management is, that the hay on the surface of the swath is apt to be blanched by the weather, the juices exhaled by the sun, and the flavour of the hay lessened. This disadvantage is, in a great measure, only imaginary; because, after the hay has lain a day or two in the cocks, the whole becomes so much alike, that the exposed part can scarcely, if at all, be distinguished from that, which was in the bottom of the swath. The dried part imbibes the juices of the moist, and the

the moist is kept open and more accessible to the air by means of the dry.

The practice of others is to cut down their hay in a dry day, and in the afternoon of the same day to make up their hay into small cocks, by which means the whole juices are preserved and the damage of blanching completely obviated. The objections to this mode are, that it occasions unnecessary labour; that if rain happens to fall, the cocks are so moist, that the hay may spoil before it can be opened out; and that they are so small, if wind blows, they are in danger of being overturned. As a remedy against its being too moist, it is recommended to draw two handfuls of hay to be laid across on the top, by way of a thatching to the cocks; and in the last case, to press them down a little with the hand, will render them more firm.

Mr Paterson of Castlehuntly, in the Parish of Gowrie, makes his hay, by employing a person to follow the mowers, who turns the hay over and over, till it be completely winn. If the season be favourable, it is put into the tramperick in the stack-yard. Upon his farm 300 stones of 22 lb. English to each stone is accounted a good crop from an acre of land; which is not uncommon in that district and in several other parts of the county. In the year 1786, he had 6000 stones of hay from a field of 13 acres, sown originally among wheat; and for the second crop of the same field, that season he received L. 2 : 13 : 4 per acre.

The late Mr Mylne of Mylnfield, in that neighbourhood, had a custom of eating his hay, sometimes, with sheep, close to the ground, till the 15th of May, provided the ground be perfectly dry; and by the middle of July, he told me, that he reaped from 250 to 300 stones of hay, by the acre, from the same field; which is as much as is expected, when not
eaten

eaten down in spring. The hay in this case is only about two weeks later than ordinary, and the field is enriched by the manure of the sheep, besides the rich supply of food which they receive. This practice is somewhat similar to that of Sir William Murray of Auchtertyre, in consuming the first year's crop of sown grass with sheep, mentioned above in the Section on pastures. Nor do I see any objection to either, unless the sheep bite so close as to cut off the bud from the heads of some of the red clover, which would render these plants useless. Sir William recommends only ryegrass and white clover, and perennial red clover.

One precaution in hay-making is absolutely necessary, never to make hay up into the first cock, when it is in the least degree wet; otherways it soon becomes mouldy, by sitting so close together, as to exclude the air.

Whether a farmer thinks proper to make up his hay into the first cocks in either of the two ways above-mentioned, or in any other, which he may prefer; yet when these cocks are to be turned and two or three of them put into one, according to the condition of the hay, he should not neglect to put the driest part of the old cocks next to the bottom of the new ones; and continue to do so every time the ricks are turned, until the hay be ready for the tramp-rick.

It is almost unnecessary to advise a farmer of experience, that in making tramp-ricks, they ought to be secured, by one rop over the top, in the direction of that point from which the most violent winds are expected to blow at that season, or by two transverse ropes, which is the surest way; and that the ropes ought to be so fixed at the ends, as to draw no rain into the hay. The tramp-ricks should also be neatly raked down the sides, and well drawn all round close to the bottom, so that the rain may fall from the sides into the

the

the earth; not leaving the hay in a flounce at the skirts, in a slovenly manner, which part of the hay is entirely spoilt, if it remains long in the field. If tramp-ricks are made, where the hay grew, make them always on the crown of the ridge, that the water may run freely off in the furrows: But it is more advisable to carry the hay to the place, where the stack is to be made, than to make the tramp-ricks in the field, because the second crop of that year, and the growth even of the next year, is injured on the spot, where these ricks stand; and besides, all the hay will be at hand, in making the stack, to get it cleverly finished, in case of a change of weather.

When hay has stood in the tramp-rick so long, but no longer, than is necessary to keep it from heating, because the surface is often injured by the weather, the stack is frequently made in an oblong form, which is vulgarly called a fow. This stack is not perpendicular, either at the sides or ends, but diverges gradually from the bottom up to the eaves. Then it is roofed in with the shape of a pavilion. Some farmers propose as an improvement of the roof, that there be two eaves on the sides of the stack; one at the beginning of the roof, which every stack must have, and another about a third way from that to the top. The part betwixt the first and second eaves, slopes less; the part betwixt the second eaves and the top, is finished either to the square, or a foot or two above it. But in a stormy climate, it is safer to be a foot or two above, than at the square. This and many others of our improvements were introduced into this country from beyond the Tweed, where they were brought to perfection by that generous, enterprising, and high spirited people.

It is computed that a stack of rye-grass hay, which is a
year

year old weighs, for every cubic yard, ten or eleven stones, of Dutch weight, viz. $17\frac{1}{2}$ lb. English, to the stone; clover and rye grafs somewhat less, and clean clover still less.

It has been generally understood, but not examined with sufficient accuracy, that four-pence is as good a price for hay weighed from the tramp-rick in August or September, as six-pence at Candlemas or March, i. e. that hay does decrease one third in weight during that time. An experiment of Mr Robert Webster at Mains of Errol will throw some light on this matter. He weighed two stacks of hay from the tramp-rick, in August 1793, each consisting of 400 stones of similar hay, from the same field, and at the same time. Wishing to ascertain how much the weight would decrease, he re-weighed the one upon the 17th of February 1794, which produced 372 stones; and the other being re-weighed upon the 26th of May 1794, produced 336: The first having only decreased at the rate of 7 per cent. instead of 33 per cent. as is commonly supposed; and the decrease of the second being 16 per cent.

By a similar experiment with the crop of 1795, Mr Webster found the decrease of the weight of hay about 16 stones more in every 400 stones, than it had been in the crop of 1793; but says that the hay was cut more green in the last, than in the first instance; which must always affect the decrease of weight for several months, after hay is put into the stack.

Although there is no doubt that hay as well as other vegetable substances will heat, when put together in great quantities, either too green or with much of the natural sap; yet there are so few instances of hay stacks taking fire by internal heat, that it appears superfluous to give any directions about that matter, except recommending that the hay be

more properly winn, before it is made into a stack ; leaving vents in the stack, if the hay be moist. A moderate degree of heat will do it no harm.

In the vallies of the Highlands, near the heads of lakes and at the confluence of rivers, where the land is low and liable to be flooded by natural causes, it has been remarked already that there are extensive fields of natural hay. In these swamps and wet meadows, the hay is various in its quality, according to the species of grafs that predominates in the soil ; the wettest bottom producing the coarsest grafs, and the driest the finest, but least abundant crop. In general bog hay, as it is called, is about one third inferior in quality to that from sown grafs : and the method of making it somewhat different. This hay is commonly so soft, that if made up into cocks without tedding, it might sit too close to become pervious to the air and wind ; the blades are so small, and the seed stalks so few, that the rain would penetrate into the cock. It must therefore, in that rainy climate, even at the risk of having its juices exhaled, be often opened out, and exposed to the sun and wind, in good weather, before it be stacked or put into the barn. But an intelligent farmer is careful to preserve its quality as much as possible, and for that purpose, exposes his hay, just as much and no more than is requisite for its preservation.

The natural hay of rich ley ground is preferable to that made of clover and rye grafs, for carriage and saddle horses, which are much upon the road. The former gives them better wind ; the latter renders them puffy. I learned from a nobleman, whose office at court gave him an opportunity of examining thoroughly into this matter, that good ley hay is much sought after both for his Majesty's horses, and for other horses of this description about London.

SECT. IV. *Feeding.*

WHEN stock is fed judiciously, regard is paid to the nature and quality of the food, the purposes intended, the time necessary to accomplish these purposes, and the taste of the animals to be fed.

In the section relative to the culture of turnips, some remarks have been made about feeding with that useful root, which it is unnecessary to repeat in this place. Previous to the introduction of sown grasses and field turnips into this country, the cattle were fed in summer by pasturing on natural grass in the fields; and in winter they were supported by dry provender. This limited system is going daily into disuse, or rather undergoing an improvement, in proportion as farmers acquire more knowledge in rural economy, and the feeding of cattle becomes more an object of attention.

In several parts of this county, where this subject is properly understood, the milch cows are generally fed in the house or in a shade, while cut clover is in season; and allowed an airing once a day in an adjoining field. Although this practice is attended with more labour, than leaving the cows to pasture at large in the clover field; yet the advantages which other ways attend it, by far overbalance the additional labour. The clover is saved from being covered in many places with dung; the field is saved from poaching in rainy weather; the dung-hill for the next year is greatly augmented; the milk will be more copious; and double the number of cows maintained on the same extent of ground.

The quantity of butter and cheese said to be produced from the acre, or from a certain number of cows fed in this manner, is often exaggerated; at least appears to be so. T

decline therefore to quote instances of either. It is sufficient for the satisfaction of those, who wish to adopt this method of feeding their dairy, that of all others, it is the most productive at the same expence.

Horses are also kept in better condition and more economically fed, by cut clover, than by allowing them to run about and tread down their food in the field.

An ingenious improver told me, that cattle fed upon turnips will eat one third of their weight in 24 hours; but others have found, that by being constantly supplied for one day, they can eat a great deal more. Perhaps they may not be able to eat a great deal more, every day successively. The same improver says, that a horse of about L.20 value will eat eleven stones of green clover in the same time.

The danger arising to cows from eating too plentifully of green clover, was taken notice of in the section relating to clover; and a remedy was pointed out to save their lives.

Turnips, cabbages, oil dust, the offal of distilleries and greens, are used for feeding cattle, when the cut clover fails. In this case and in all others, cleanliness is of the utmost consequence. The construction of stables proper to insure the removal of urine and to keep the cattle clean, while supported on this diuretic food, has been mentioned under the article relating to turnips.

When cattle are fed on pastures, care ought to be taken to examine the quality of the plants natural to these fields. On examination, many plants may be found, which are noxious to browsing animals; and the effect of swallowing these is frequently productive of disease and sometimes of death. The most hurtful are henbane, hemlock, the deadly night shade, drop-wort, and yew. If there is plenty of wholesome grass in the field, cows are taught by instinct to avoid

avoid these and any other plants, which are injurious to their health: but when they are confined in narrow inclosures, where these, or any of these plants, abound, and are pinched with hunger, it is impossible that they can all escape. Spring is the season of greatest danger, when perhaps wholesome food is scanty, and little choice left to the cattle.

Cows in spring have a natural tendency to scouring, when first removed from dry provender to grass. Herbs, which are antidotes to this disorder, such as agrimony and cummin, might be sown within their reach. If the field has not been eaten bare before winter, the mixture of old grass will in some measure prevent the laxative effect of the new. The old grass will also protect the new, and enable it to rise more early; besides that the circulation is in some degree restored in the root of the old grass itself. If the herd be few in number, the change from dry to green food may be gradual. By either of these precautions the danger is lessened.

Milk in its various modifications constitutes a considerable proportion of the food of the ordinary classes of mankind; and finds its way, in certain quantities, as an ingredient, into the luxuries of the wealthy. How necessary is it therefore to attend to the health of milch cows, by paying attention to their food; that this juice, which we derive from them, and upon which we all live in a greater or less degree, may be, not pestilential but nutritious, to ourselves. The magistrates of great towns esteem it to be a part of their duty, to take cognizance of the quality of meal and bread sold to the inhabitants, and of the weight and quality of meat exposed in the shambles; while the quality of the milk, offered to sale, which is materially affected by the healthiness of the cows and the nature of their food, has not, or at least very seldom, been an object of their attention.

It

It is commonly remarked, and I believe with justice, that the same number of acres of pasture-land will feed cows better, when divided into two or three inclosures of a moderate extent, than when all are depastured at once, in one great inclosure. The cattle will carry more beef and tallow at the end of the season, when they are changed alternately every two or three weeks from one inclosure to another. It is not so certain, however, that this maxim applies with equal success to the feeding of sheep, which naturally affect a wider range than the sluggish cow.

It is often recommended to put animals of a different species into the same field to feed together. Sheep and horses may thrive in this situation, because the horse eats the fat grass that springs immediately from the dung of that season, while a sheep prefers the poorer and cleaner grass. They both bite close, and have an equal chance for food, while it lasts; but cows have no chance with either of them, if there be any scarcity.

How many sheep or cows or horses can be maintained on any given number of acres, it is almost impossible to ascertain with any degree of accuracy, where the quality of the soil, the richness of the grass and the size of beasts is so various. The bleak mountains of this county are now depastured by sheep alone, with a few gleanings of the former goats, and are thereby becoming more verdant every year, and capable every succeeding season of feeding more on the same extent of territory. The lower pastures, not in cultivation, are also improving, by being the residence of sheep in winter and spring. Yet it is a curious fact, that the heath is not extirpated so rapidly on the low, as it is on the high hills. This may perhaps be occasioned by a difference in the manure of the sheep at different seasons. It is more power-

ful

ful in summer and autumn, while they frequent the higher hills, because they live more plentifully and eat food in its highest luxuriance, than it can be, while their food is mostly withered grass and their meals more scanty, which is the case in winter and spring. The heath itself may be stronger on the skirts than on the tops of the mountains, and consequently banished with more difficulty.

The pasture upon good land, after one or two crops of hay have been reaped from it, is as rich in many parts of this county as in any part of Britain: The grass is as luxuriant and the pile as close, the natural white clover and daisy as thick as they can stand. And the great specimens which are given of the produce of an acre, either in milk or weight of meat in other places, we may, without a blush, claim to ourselves. Within sight of the window, where this report is written, twenty four sheep and lambs, many of them the large English breed, are feeding upon two acres and a half of grass: and as a proof that they have abundance, the owner is obliged to turn in other cattle occasionally to keep down the grass, to prevent its running into seed and becoming useless.

CHAP. IX.

GARDENS AND ORCHARDS.

HOETICULTURE is making rapid progress in the county of Perth: but where there is such an extent of territory, such a variety of climate and of soil, it naturally follows that this species of improvement is more attainable in some districts than in others. Along the circuitous bank of the Seed-
law

law hills, and indeed in the whole Carse of Gowrie, the mildness of the air, the shelter from the north and eastern blasts, the depth and fertility of the soil, and the sloping aspect to the south, like a hanging garden, which the general appearance of the country exhibits, invite the industry of man and indicate the intention of nature, to render this favoured spot productive of fruit. There are upwards of twenty orchards in the Carse of Gowrie. That of Monorgan lets for about L. 100 of yearly rent. Seaside brings somewhat less; and others in proportion to their extent. Mr Donaldson, who wrote a report of this part of the shire of Perth in 1793, says, that the fruit from these orchards, which consists of apples and pears of all the various kinds, are partly sold in the neighbouring towns, and the remainder is exported to Montrose, Aberdeen, and other parts on the north east coast of Scotland.

Many of the gentlemen in the Carse have gardens, which are at once an evidence of their industry, of their taste and of their opulence. It was to me a matter of regret that I could not view them all. That of Mr Paterfon of Castlehuntly has 300 feet of glass. He has introduced steam into his hot-house, for raising melons with dung, and steam also into the vinery and peach-houses. He entertains no doubt that steam will answer for pine-stoves. He has peaches, nectarines, apricots, almonds, walnuts and figs on a wall. Similar attention I understood was paid to horticulture in other parts of the Carse.

Next to the Carse of Gowrie, the best exposure in all this county for raising fruit is the foot of the Ochills, from the bridge of Allan to Dollar. The rays of the meridian sun are reflected so powerfully from the precipitous hills on the north, that all the productions of the earth are reared, as in

a hot

a hot bed. Along the north side of the water of Earn, from the village of Comrie to its confluence with the Tay, the fine sloping banks are favourable to the growth of fruits of various kinds: In the vicinity of Perth, in the tract of the Tay and of the Islay, and in many parts of Monteath, the ingenuity of man has seconded the benignity of nature, in cultivating different kinds of fruit. Nor are the vallies of the Highlands defective in shelter; although the soil in general is too thin and light for nourishing the trees, which carry the larger fruits. In these higher districts, stone fruit, such as geans* and cherries, abound. The trees thrive well, live long and carry fruit of the finest flavour and most savoury taste. The cream-coloured cherry of Advorlich and the black gean of Castlemenzies are highly esteemed in respect of beauty and relish. It is singular that this fruit, which is a native of Asia, and unknown in Europe until Lucullus brought it to Italy, after the Mithridatic war, should arrive at such perfection, under all the disadvantages of climate and soil, peculiar to the Highlands of Scotland. Such a powerful influence does Nature exert over all her productions, that in due time she will accommodate both plants and animals to their situation. This controuling power of Providence is less attended to than it ought. To it we owe many of the comforts of life.

The fruits that grow on shrubs are in the highest perfection in a thousand places. The goose-berries and currants of Lawers and Kippenrofs, both for variety, size and flavour, are instances out of many to what pitch these fruits can be brought by industry. The several kinds of pot-herbs and roots are not only raised in gentlemen's gardens, but by the farmers and villagers.

G g

Although

* A kind of small cherry.

Although my directions from the Board led me to Castle huntly, which induced me to pay attention to Mr Paterfon's garden, the reader is by no means to infer, that there are not similar gardens, several made and others making, in different parts of the county. At the house of Dunkeld, at Belmont Castle, at St Martins, at Rossie, at Drummond Castle, at Gartmore, at Cardross, at Blairdrummond, at Kier, and in many other places, where there are proprietors of taste, no labour is spared and no expence is grudged to bring horticulture in all its branches, to the highest state of improvement, of which this climate renders it capable.

To some readers what has been said may appear tedious and uninteresting, while others may account it superficial by reason of its brevity.

CHAP. X.

WOODS AND PLANTATIONS.

THE Highlands of Scotland, like all other countries where the land is not overcharged with water, was at one period under wood. Tillage and other causes have removed the vestiges of trees, in certain soils; but their roots and trunks are found almost every where in moss, both in the flat land, in the vallies, and on the very tops of hills. The progress of population, the necessity of cultivating land to procure farinaceous food, destroying the favourite haunts of wild beasts, and the fastnesses of lawless men, all contributed their share, in laying the country naked, by the destruction of the tallest forests. Even in the bottom of Moss-Flanders in Monteath, which is in most places from 10 to 12 feet deep, the roots of trees are said to have the marks of the hatchet.

hatchet. The crowded population, which the feudal system, being altogether a military establishment, encouraged in latter times, and the exigencies of the state in requiring so often a multitude of soldiers, unproportioned to the extent or fertility of Scotland, in order to resist fierce invasions and contend with powerful neighbours, brought every inch of land into tillage, which, according to the ideas of these times, was capable of producing grain. Nothing was left unploughed, where the rude husbandry of our fathers supposed an ear of corn could grow. The woods were banished into the steep declivities of glens or among rocks and stones and other places deemed incapable of cultivation. The open country was totally divested of cover; because the growth of timber was considered as an obstacle to abundance of food, or in other words, to population. The ancient barons, more eager for warfare and the extension of their property than for its improvement, conspired with the spirit of the times to desolate the woods.

About the beginning of this century, woods began to claim some attention. For fifty or sixty years back, the possessors of some estates in this county thought of repairing the devastation, which had formerly been permitted or encouraged on the growing timber. They saved what remained of their woods and made new plantations, in places convenient for that purpose. Within these last thirty years, plantations have increased rapidly both in size and number. In the Stormont, in Athol, in Breadalbane, in Strathearn, in Strathallan, in the Carse of Gowrie, in the vicinity of Culrofs, in Monteath, almost in every corner of the county, there are thriving plantations, which consist of a variety of forest trees, adapted to the nature of the soil, that do honour to the spirit and judgment of the owners. They are

already an ornament to the country and a profit to the possessors.

In former times a few favourite trees might be seen about the residence of a great man, some of which may have stood for centuries and become venerable by their years; but the scale has been greatly enlarged in this part of the empire, beyond all example at any period or in any age.

The (*pinus rubra*) Scots fir is the most common pine in these plantations. It is extremely hardy, is naturally suited to all climates and almost to all soils; although it seems to prefer the colder regions, being found to thrive within the frigid zone. The larch has many years ago been introduced into this county, as a variety in our plantations. Mr Marshal remarks in his Survey of the central Highlands in 1792, "that there are Larches at the Castle of Blair Athol and Dunkeld, planted fifty years ago, which measure full eight feet in circumference, at five feet from the ground; and that a similar luxuriance of growth has taken place at Taymouth." The largest larches in this county, or perhaps in several counties around it, are at Monzie, which measure five feet in diameter, and about fifteen in circumference. There are larches of a great size at Blair-drummond, Gleneagles, Rossie, and many other places in Perthshire. I saw larches planted 47 years ago two feet and a half diameter at five feet from the ground, corresponding very nearly to what Mr Marshal says; a size to which no other species in this country would arrive in the same time. The boards had very little white timber at the edges. Posts of larch, which had been put into a moist soil about fifteen years ago seemed still to be fresh and strong.—It is only of late that this tree has been generally planted and its excellence known in this country.

It

It is the most rapid in its growth of any tree we have, and the most valuable species of the pine. It is closer in the pores, has fewer knots, and the wood is more durable than the common fir, and withal it increases double the number of cubical feet, in any given time; which is a singular excellence.

Larches are well adapted to this climate, and are said to have been brought into Scotland, by one of the Dukes of Athol, from the frozen mountains of Carniola, which are a continuation of the Alps, bounded by the Gulph of Venice. They make excellent floors and beams for house-building, and are used in Venice and Switzerland for that purpose. They make excellent planks and masts for ships. Coxe says that the vessels on the Lake of Geneva are made of larch. Painters have trusted their works to this wood, as being proof against the worm, for which reason Pliny calls it *immortale lignum*. He says it was imported into Europe from Sardis.

Ash, elm, plane, beech, oak, laburnum, and a variety of other different kinds are intermixed in our plantations, which have a fine effect, by diversifying the appearance, and relieving the eye from a dull sameness, which never fails to disgust. The ash and the elm are the most useful, for the purposes of husbandry, the pine claims the next place. The oak is excellent for ship-building, and its bark brings a great price. The ash and the elm turn their backs to the storm when planted single, as do the larch and the beech; but the plane stands erect, spreading his branches equally on all sides, in defiance of the storm. The same may be said of the oak upon the best authority:

Quercum

Alpini boreæ nunc hinc, nunc flatibus illinc

Eruere

Eruere inter se certant : it stridor, et alte
 Consternunt terram, concussio stipite, frondes ;
 Ipsa hæret scopulis ; et quantum vertice ad auras
 Æthereas, tantum radice in Tartara tendit.

Æn. iv. 441.

In large plantations, there are varieties of soil and exposure ; and every kind of timber thrives best in a soil peculiar to itself. The trees, which keep the leaf in winter, afford the best cover, where shelter is wanted ; and of all these the spruce continues longest to carry branches near the root. Taste in planting is discovered by the variety ; and judgment is shown by having every tree of a plantation in that soil, which corresponds to its nature. An elegant writer on husbandry says

Fraxinus in silvis pulcherrima, pinus in hortis,
 Populus in fluviis, abies in montibus altis.

The oak prevails in the vallies of the Grampians, where there is a genial climate, and the soil light and dry. Ash grows spontaneously on the sides of every brook, river or lake : The alder delights in swamps and spouty ground ; and the birch climbs boldly to the brow of every hill. In the low country there are many natural woods, where the plants found cover and the situation of the ground was unfriendly to the operations of the plough : but in many of the most bleak and exposed places, hardly a shrub can be seen, to afford shelter from the cold, or to hide the sterility of the soil.

In choosing plants of forest trees, or indeed of any kind, it is proper to bring them from a nursery, as similar in the quality of soil and exposure, as possible, to the soil and climate, where they are to be planted out. The best ground for a nursery is a free rich soil, in an exposed situation, the
 freencfs

freeness and richness of the soil give the plants many small fibres, and the situation being exposed prevents the plants from being delicate. Many plantations have failed, by bringing young trees from rich and warm nurseries, near great towns, to a poor soil and a bleak climate; and many have also failed by putting down trees in ground unsuitable to their nature.

It is a singular phenomenon, that when the seeds of trees are thrown into the ground, although the stem may happen to be pointing downward, and the root upward, or both root and stem in a horizontal or oblique position, yet the stem uniformly raises its head perpendicular to the horizon, even when sown awry or on sloping ground, and the root as invariably turns itself downward.—Naturalists have puzzled their heads to account for this energy in plants, from natural or visible causes; but they have done so in vain. That structure, if there be any structure, which gives the fibres such different, nay opposite qualities in righting themselves, is a mystery beyond our reach. Their motion is regulated and their position settled by an invisible hand, which constantly superintends the most minute as well as the greatest operations of nature.

Natural fir woods are very frequent in the north of Scotland, although they are rare in this county; yet it would be unpardonable to pass over that article in silence. The family of Struan Robertson has time immemorial drawn a considerable revenue from the fir-wood on that estate, which grows naturally on the side of Loeh Rannoch; and Colonel Robertson, the present proprietor, with his usual politeness, communicated the dimensions of his woods along with other information, for this report; which merits my public thanks. His natural fir wood covers two thousand five

five hundred and sixty-six acres of land ; which is the most extensive forest in one continued tract, in the county of Perth. His detached woods of oak, birch and alder intermixed cover three thousand eight hundred and sixty-nine acres.

There was a considerable tract of natural fir several years ago near Tyndrom on the estate of Breadalbane ; but at this time there remain only a few gleanings. Natural firs are growing in one of the parks of Finlarig on the same estate, and in some other parts of the county ; but all these are on a smaller scale.

There are more oak woods and of greater value, in this county, than in all the rest of Scotland. The copse of oak is cut once in twenty-four or twenty-six years. A few spare trees of the most promising appearance and of the best figure are left at proper distances, from one cutting to another, and sometimes for three or four cuttings. The freight-est are generally spared, without attending to this circumstance, that crooked oak is more eagerly sought after by ship-builders and brings a higher price, than oak which is freight. Yet as copice wood is the object, freight trees injure it least. Scotch oak has been found in general too close in the grain to bend for ship-fides, and even for the same reason it is found to snap over when used as ribs to a ship ; its closeness in the grain is the effect of slower growth, owing to frequent checks by early and late frosts.

The purchasers of these woods begin to cut about the first of May, or as early as the bark will rise ; which depends on the progress of vegetation, in particular seasons, and the natural circulation of the fluids, that are always more copious in the rind, which separates the outer bark from the solid timber. It is from this part that trees and shrubs in-

crease

crease their diameter, and have therefore a ring for every year of their age. The cutting of oak-woods, for the most part, stops betwixt the middle and the end of July. This period is too late; because the shoots, which the stock sends forth after that time, are too tender to stand the winter's frost, and a great part of the top generally dies, which retards the growth of the ensuing year and deforms the plant.—It seems peculiar to the oak to spring twice, or to have two successive growths in one season; the first in Spring, the second in August. Contractors are for the most part bound to have the lot, destined to be cut in one year (provincially the *hiag*) cleared by Candlemas, or at farthest by the middle of March, in order not to hurt the young growth of the following Spring; and in case of failure are subjected to damages; which is generally a forfeiture of the timber left behind.

Instead of cutting all oak woods at a particular age, without regard to the soil, it might perhaps be more proper to cut woods which grow on dry, barren soils, at twenty years old, before the growth languishes, before the stunted trees gather moss, and the bark next the root becomes hard and sapless. This moss must be scraped off, before the bark can be sold, and when the bark hardens on the tree, it cannot be peeled without much difficulty. The young shoots will spring more vigorously by that management, than when woods of this description are allowed to attain the ordinary age. On rich soils, they may safely be allowed to grow, till the trees are eight or nine inches diameter at the ground; because thriving woods increase more in weight of bark during one year towards the latter end of their ordinary time of standing, than they do in double that space in their younger years. But if they are left to surpass the ordinary

H h

period,

period, the succeeding growth suffers; because the shoots from young stocks are always more vigorous, than from those which are old.

If the advantage of the copse alone is attended to, no standard should be left, except such seedlings as appear necessary to renew the stocks, where old ones are wearing out; because when left for three or four cuttings, they seldom spring, except in the following case. They will always spring, if the large seedling be peeled standing, and to prevent splitting, be not cut down till Christmas.

It was lately discovered at the house of Buchanan, the principal seat in Scotland, of his Grace, the Duke of Montrose, that although aged oaks, when cut down, very rarely or never send forth young shoots from the parent stock; yet if the earth be cleared away, so as to expose the roots, to some distance from the old stock, young shoots often spring from the bark of these roots. This discovery merits attention; and may probably be tried with success, with regard to all the aged trees of such classes, as usually spring from the stock, when they are cut down young.

The bark of these trees at an advanced age is so exceedingly thick and so very dry, that the tender shoots neither can penetrate the coat that resists them, nor find juices to nourish them, whereas the roots that had been covered with earth, have bark which is thin and juicy, by not being exposed to the injuries of the weather, and therefore the shoots can more easily get through their bark and find nourishment to push them forward.

When the bark is dried, it is sent off to the tanners; and if they reside any where on the coast, it is carried to the nearest port. Some years ago, one shilling was accounted a good price for the stone of $17\frac{1}{2}$ lb. English (provincially Dutch

Dutch weight); now one shilling and six-pence is very common, and the price is still rising.*—The crooked timber, of a proper size, is sent to the ship-carpenters in the different dock yards; the other timber is either made into spokes and sent to the great towns for the use of the coach-makers, or sold to the country people for various purposes, or reduced to charcoal for the foundries. But the practice of charring timber does not prevail so much as formerly, because the managers of these furnaces char the pit-coal found in their neighbourhood, and use it in place of the other; which saves them the expence of a long carriage.

The bark of the birch tree was formerly more used in tanning leather, than at present; because it seems that its virtues are less than that of the oak. It gives the leather a beautiful light brown or yellow colour. The bark of the willow and the mountain ash is used equally with oak bark. The last is a powerful astringent; is said not to be much inferior to the Peruvian bark, and to be a good substitute for it. Tanners esteem it principally, because it excites a fermentation in their pools.

For some years back, in cutting woods on most estates, the stocks are peeled to the ground; whereas according to the former practice, the bark was never allowed to be taken off below the ax, or the place where the tree was cut. By the present method, the young shoots are better spread and have more air, than when they grew all in one bush. They are nearer the earth, each standing on its own base; by which means they resist the winds more firmly, and acquire their nourishment from the ground more directly and plentifully, than through the medium of the parent stock, or by forming a crust of new timber around it. Care should however be taken, not to allow the stocks of oak to be peeled below

H h 2

the

? It has again fallen since this Report was written in 1797.

the ground, which might happen either by intention or neglect, when a strong slice of bark is drawn off; because the new shoots spring only from such parts of the stock, as have bark above ground or very near the surface, where the air can freely circulate.

Oak woods newly cut are commonly inclosed, either with a stone wall or railed in with a part of their own timber; and are preserved from cattle, for the space of five, six, or seven years, according to the option of different proprietors. But unless the soil be uncommonly rich, in five years, or even in six, the young shoots are neither high enough, to be out of the reach of cows, which eat them greedily, nor strong enough to resist their weight, when they press upon them, in order to reach at the succulent buds on the top. Horses are not apt to do so much mischief, unless they are pressed with hunger. When oak woods are eaten or cropt with cattle, they will never thrive, until they are cut over at the ground; and in this case, the sooner it is done, the better. All copse is weeded, some at one age and some at another, according to the fashion of particular countries or the opinion of different proprietors. Nature points out the proper time of beginning this operation. The stronger shoots never fail to throw the weaker ones aside in the stock, which stretch out somewhat obliquely in quest of air. There may be a few weak shoots in the heart of the stock; but they are most frequently forced to the sides.—Some persons are so careful of their oak woods as to weed them twice. In weeding oak woods no indulgence ought to be shown to birch or any other species, which interferes with the oak; because the oak grows slowly and is easily choked by other kinds which are far inferior in value. This practice is recommended by the example of Mr Drummond of Strageth and others.

Pro-

Proprietors, who are careful to improve their finances, by a proper management of their woods, do often, when their woods are newly cut, plant all the vacant spaces, with trees suitable to the nature of the different kinds of soil. Wherever hazel grows, acorns ought to be sown, or rather young oaks planted. Two or three cuttings of the hazel, which is done at small expence, would suffice, until the oaks got the mastery.—The hazel and oak delight in the same soil and exposure, a dry gravel on a sloping bank, and not far up the hill. Hazel woods have some oaks, and oak woods have some hazel interspersed; which shows that they are kindred plants in respect of nourishment, although very different in point of value. The hazel sells for hoops, which in an inland situation are of little account, whereas the oak is the most valuable timber we have, were we to reckon on the bark alone. It is entirely owing to negligence in this respect, that we see oak woods all over the country infested with hazel, birch and other trumpery; because every time the wood is faved, all the vacant spots, where timber will grow, we find, are sown at random by the hand of nature with some kind or other.

Ornament and utility ought to be chief objects in planting. A good judge of human nature says,

Omne tulit punctum, qui miscuit utili dulce.

Oak seems to be of all others the fittest tree for these purposes, in an inland situation; because the bark yields a quick return, from the successive cuttings of the copse, every twenty-six years, nearly equal to the value of the land, on which it grows; and the timber serves the ordinary purposes of the country; whereas other timber may not find a market, if remote from water carriage. While the attention of gentlemen is directed to adorning their residence, no species

species of trees is so well adapted for this purpose, as that which springs from the stock and is a permanent beauty. If ornament alone is the proprietor's object, although other forest trees ought not to be excluded, the oak seems to deserve a preference, by being allowed to rise to its full stature. It is the longest lived tree known in this part of the world, the yew alone excepted, and in its aspect imitates the boldness and grandeur and duration of our hills.

The most approved mode of planting trees, especially of oak, where there is not already whins or broom to afford shelter, is to begin by planting larch or birch in the field destined for the plantation, at the distance of eight or twelve feet; and to keep the oaks in the nursery, transplanting them every third year, till the larch or birch have got up to three or four feet high. Then the oaks should be nearly of the same height, and put out in the open spaces, at the distance of fourteen feet, as nearly as may be; this being the distance suited to the future stocks of the copse-wood. The larch and birch should be pruned, as they interfere with the oak, until the former attain such a size, that they can be cut out, for slabs or other similar purposes, leaving for beauty, what may be thought proper.

The best method of planting pitted trees, after rejecting all that are not well rooted, and pruning off the injured parts of the fibres, is, when they are about four feet high, to make pits, twenty inches wide at the top, and as nearly as may be, fourteen or sixteen inches at bottom, and of this depth; except in wet soils or among rocks, where it is more advisable to make the pit shallower than fourteen inches, and to collect a hillock of earth round the root of the tree. In making these pits, care should be taken, to lay the surface seal or sod to one side, the good earth next it to another,

ther, and the bottom earth to a third. In planting, the sod ought to be thrown into the bottom, with the red side uppermost, the root of the tree placed on that sod, and the good earth thrown on the fibres, with as much more of rich earth as may cover them completely, observing always to throw in that good earth as lightly as possible and to shake the tree gently, that it may mix fairly with the roots. Then the bottom earth ought to be put in and pressed with the foot, leaving a hollow ring next the tree, if the ground be dry; but if the ground be wet, less pressure with the foot will suffice; and in this case it was said already that a hillock ought to be raised above the surface, that the trees might find nourishment, when they expand their roots.

Trees ought to be planted as soon as possible after they have been raised; but if it should happen otherways, or that the ground and season be very dry, their roots should be moistened in water, before they are put into the pits, to restore the tone of the fibres, that the juices may flow the more readily into the alimentary canals.

Before agricultural improvements were so well understood as they are of late, or occupied so much of the attention of all ranks in this country, many moorish tracts of land were deemed incapable of cultivation, or of making a return in any other way equal to their being planted. Proprietors, even in the Carse of Gowrie and in the Stormont, being actuated by this principle, about twenty years ago, planted the waste lands upon their estates, with Scots firs. They have now found that this soil, by being wrought, will make good arable land, and will be more profitably employed in tillage. Some thousands of acres have accordingly been cleared; the plantations rooted up; the soil subjected to the plough, and let at a progressive rent, in some cases, amount-
ing

ing already to twenty shillings the acre. Betwixt Coupar and Perth, a tract of thirteen miles, the plantations on two thousand acres, upon both sides of the public road, have been grubbed up; and the operation is still going on, both there and in other places.

So powerful is the principle of imitation, that we all go frequently one way, until we have gone too far. All men can imitate example, but all men cannot reason so as to form a principle of action to themselves.

In a certain degree this operation is salutary; but if carried to excess, it will leave the face of the country naked; and perhaps in all cases, the cost is not counted, nor the ballance fairly stated between the plantation and the produce arising from some poor soils, by an arable system: yet it must be admitted, that no trees are equal in value to corn and grass, either to the landlord or the public, where the cultivation of these can be prosecuted with success.

CHAP. XI.

WASTES.

ALL unproductive land, which is abandoned as unimproveable, whether it be a common or not, may be called waste. Nature has been so kind to some spots, especially low lying meadows, where there is plenty and no more than plenty of moisture, for raising the meadow grasses, that it is doubtful in many cases, whether the industry of man can render them more productive than the benignity of nature has already done. Many such tracts of meadow ground in this county might be pointed out; which may be traced in a
great

great measure, from what has been said in the Section on meadows.

Wastefulness admits of various degrees. Some land in a state of nature may be worth ten or even fifteen shillings an acre of yearly rent; while other land is not worth so many farthings: and betwixt these extremes, there are many gradations. Even the land, which is worth fifteen shillings in its natural state, may in a certain sense be called waste, if it could be brought by cultivation, to be worth twenty or thirty shillings: and the neglect in this case is more censurable, than in abandoning ground of less value, which by a variety of untoward circumstances is almost incapable of cultivation. In the county under review, there are many thousand acres in these situations; more however in the last state than in the first. When the condition of land can be meliorated, it is waste in the proportion between its natural and ameliorated condition; but when its produce cannot be increased, which is the case with many of our mountains, it ought to remain in its present condition. It is not the interest of any man to attempt an improvement, unless the expence be refunded by the produce; yet in many cases the probability on the side of profit is very small. It is unfair therefore to stigmatize those as indolent, who make no attempts to improve land, which is not capable of being reclaimed. But this is no excuse for the indolence of others, who make no efforts, where the subject is inviting, and the probability of profit in their favour.—After all, *improveable* is an indefinite term; and the last generation thought many spots unworthy of culture, which we now see converted into good arable land. There may happen to be a piece of naughty land, near a gentleman's door, whose barren appearance is an eye-sore, and he must improve it at any expence.

It appears to be impracticable to improve the high heath-clad mountains in the interior districts of Perthshire, in any other manner than by stocking them with sheep, or by spreading upon their face, the innumerable rills, which descend from their brows. Either of these will extirpate the heath. All the land within the old head dykes, and the other green ground at the base of the hills may and ought to be improved. The low lying moors, which have been long abandoned to their natural sterility, seem to be capable, by proper attention, of making tolerable returns, some by one species of improvement, and some by another, judiciously adapted to their soil and other peculiar circumstances.

1. *Mosses.*

THE original formation of moss or peat-earth is so well ascertained and so accurately described in almost every treatise on agriculture, that it is unnecessary to enter into any detail on that subject. The most useful question relative to this species of land, is, what is to be made of mosses, and how they are to be rendered productive.

Mosses of small extent, where there is a mixture of other earth and the fall considerable, are generally pared and burnt, with profit; but if there be little or no fall they may be planted with potatoes in lazy beds for a first crop, and the furrows left open for drains. With the first or second white crop, the seed of common grasses, which is always to be met with in meadow land, ought to be sown; which will yield a heavy crop of hay for some years and afterwards a plentiful spring of strong coarse pasture, consisting mostly of the aquatic plants.

Where there is plenty of brush wood, deep mosses, with a good fall, are most frequently drained, and drawn in
ridges

ridges like other land. The drains may be made with fagots, put in, either longitudinally and sloping, having the slope of the truncheon always in the direction of the fall; or they may be laid transversely, in the shape of a St Andrews Cross, and the land afterwards pared, burnt and levelled.*

Nearly similar to this mode of improving moss-land, are the directions contained in a communication from a gentleman in Airshire to another gentleman in my neighbourhood, which is said to be borrowed originally from the practice in Ireland. The principal difference is that he directs the moss to be *delved* or dug up with spades, and the manure to be chiefly lime.—Having not seen or heard of this improvement of the mosses in the county of Air, when my first report was printed, I shall now give it fully, and am inclined to do so the more readily, because it is found by experience to be effectual.

“The first thing to be done, is to mark and cut proper master-drains, eight feet in width by four and a half in depth, declining to two and a half at the bottom; which drains cost in Airshire at the rate of one shilling per yard. In some instances it will be found necessary to cut these drains much deeper, and consequently at greater expence; and the drains are almost in every case so conducted, as to divide the field into regular inclosures, as well as to carry off the superfluous water.

“Then the ridges are marked off regularly, and in breadth six or seven yards; seven yards are preferable; which ridges

I i 2

are

* The spade for paring ought to be similar to that used in Scotland for casting Turf, provincially the Flaugher-spade; only a little more scooped in the iron and rounder in the fore part, having a perpendicular knife, standing up at one side of the iron sole, to cut the sod, as the Highlanders have to the *lugged* spade, which they frequently employ in casting peats in tough mosses.

are formed with the spade in the following manner. In the center of each ridge, a space of about twenty inches is allowed to remain untouched; and on each side of that a furrow is opened, which is turned inward so as completely to cover that space, like what is called the feering of a gathered ridge. Thus begun the work is continued, by cutting with the spade in breadth about twelve inches and in length as may suit, till the whole be turned over, to appearance as with a plough, reaching back to the furrow that bounds the ridge. That furrow is a space about two feet, which is cut out, and cast on the sides of the ridges. The depth of this division-furrow ought to be regulated by circumstances, so as not to lay the ridge at first too dry by being raised in the crown, and at the same time so as to bleed the moss and conduct the water to the main drains.

“The next operation is to top-dress the ridges with lime, the quicker the better, at the rate of from four to eight chalders to the acre. Five or six chalders being the ordinary quantity. I have even seen considerably more applied with effect. The field thus prepared is ready to receive the seed, which is sown in the season, whether dry or wet is a matter of indifference, and harrowed in with a small harrow, drawn by two men. Four men, with ease will harrow at least five or six a-day; two and two by turns, drawing the harrow and breaking and dividing the mould with spades.”

“But I would recommend planting potatoes, as preferable for a first crop, because oats for the first year frequently misgive. The potatoes are planted in what is called the lazy-bed way. The method is simple and attended with little expence; and the moss is prepared for them in every respect and limed as before directed, for a first crop of oats. The beds are marked off across the ridges, in breadth from
five

five to six feet, with intermediate alleys of about two feet as a furrow. The beds are covered over with a thin stratum of dung. The sets of potatoes are laid on the dung and covered from the intermediate furrows; which is followed with another covering, in all, about four or five inches.

“I not only consider the planting of potatoes at first as the most certain crop, but the most successful method at once of reclaiming the moss, not owing perhaps so much to the influence of the dung in aiding the fermentation already begun in the moss, by means of the lime, as to the effect of the potatoe-crop in over-shadowing the ground and causing a stagnation of air, which prevents the exhalation of moisture, and thereby accelerates the putrefaction and decomposition of moss; and also to the effect produced by the roots in dividing the moss, separating its particles and rendering it into mould. This practice is now followed in general, wherever dung can be commanded; and the produce is between forty and fifty bolls from the acre. When the potatoe-crop* is removed, the ridges are again put into proper form; which is done, not by throwing the manured surface into the trenches between the beds, but by making two or more cuts with a spade into the sides of the beds which are pushed in opposite directions to close the lips of all the trenches.

“If potatoes are not planted as a first crop, the field is prepared for a second crop of oats, by cutting the furrows across the ridge and turning them over, and by cleaning out the division furrows. To prepare for a third crop, the same operation is performed.

“The

* Potato crop is an absurd expression, but we must use it for want of one which is more proper. Custom has given a currency to many absurd phrases.

“The most proper season to prepare the moss for a first crop is early in the preceding summer. In which case, the lime aided by the heat, the harvest rains and the winter’s frost, has a powerful effect in promoting the process of putrefaction: consequently a mould is formed to receive the seed, the ensuing spring. Although I mention the preceding summer as the proper season to prepare for a first crop, the common practice is to prepare for it in the course of the preceding winter; and to prepare for the crop of the second year as soon as convenient after the removal of the former crop.

“The first year’s crop is sometimes good, but very uncertain, because the lime has not had time to exert its influence. The second year’s crop will run from five to ten bolls, the acre. A first crop after potatoes is seldom less than ten bolls; some times considerably more, from the acre. Early oats, the small Dutch or Polish oats are sown as preferable. The grain produced is equal to any in the country. In general, four or five, or even six successive crops of oats are taken without any additional manure, and without any apparent signs of the soil being exhausted. On the contrary the moss is now converted into a dark brown mould; and what alone renders it less productive of corn crops is its running into sweet luxuriant grasses, the soft meadow grass, the daisy and white clover. Along with the fourth, fifth or sixth crop of oats, grass seeds are sown, which in common produce an abundant crop of hay, and afterwards afford excellent pasture.

“I now consider the moss to be in a permanent state of improvement; and if its own fodder be converted into manure, and applied to its own use, together with an occasional aid of lime, it will in my opinion be forever productive in
potatoes

potatoes and corn crops. In support of that opinion, a field of mine has been in crop since the year 1783. When it began to run into grafs, it was completely delved over, a fresh quantity of moss turned up, top-dressed anew with lime, and planted with potatoes in drills, and hand-hoed. After the potatoes a crop of barley was taken and followed by successive crops of oats; the last to be barley also with grafs seeds. 'The same rotation to be continued by way of experiment.' So far the Airshire gentleman, on whose paper no alteration has been made, except in the punctuation and trifles of that nature.

The Board of Agriculture directed me to enquire with care into the improvements, now carried on at the moss of Blair-drummond or Kincardine, which is a part of Moss-flanders; but as it would be difficult to abridge a long detail of operations and other matters of fact, on the one hand, and on the other, the whole circumstances taken accurately down might swell this article beyond measure, it has been recommended to adopt the account of that moss printed in the *Encyclopædia Britannica*; which may be found in the Appendix subjoined to this Report, N^o 2. The Preface to that Appendix is written by Doctor Walker, professor of Natural History in the University of Edinburgh, and the Postscript relative to the school is added by another gentleman, who had the best opportunity of knowing the truth of all the circumstances he relates.

But notwithstanding the distinct view, which these papers give of the operations in the moss and of the situation of the tenants planted in that colony, there is one omission which I must supply. In none of the papers alluded to is justice done to Mrs Drummond, whose benevolence is no less eminent than her conjugal virtues, and whose good offices to
the

the people in the moss is by no means inferior, in her own sphere, to that of her husband. If any of them are hungry, she feeds them; if any are cold, she clothes them; if any are sick, she visits them; and if any require medical aid, she pays Mr Wingate, a surgeon of eminence in the neighbourhood, for his medicines and attendance.

I cannot express the gratification I felt at the happiness of about six hundred British subjects in this settlement, who otherwise must have been lost to their country. Men, women and children were employed; their houses snug and their fuel plentiful; their gardens, their patches of clover and their corn-stacks bespoke their industry. Contentment and health appeared in every countenance; and when mention or inquiry was made of the favours they receive, every tongue spoke the language of gratitude and esteem.*

2. *Moors.*

THERE is a great tract of moor or waste land, unfit for any useful purpose, except planting, betwixt Auchterarder and Tullybardin, and westward to the military road or farther. A few half starved sheep may be seen in some places on its skirts, but the great body of the moor in its present state is useful neither to man nor beast. A small plantation of Scotch firs have grown several years in one place of this moor, to a considerable size; and many other spots are planted by different proprietors, which are generally in a thriving condition, and show that it is a proper soil for firs. As the moor is already divided, if the co-terminous heritors would put in permanent Land Marks on their respective limits, and be at the joint expence of a bounding fence round the

* These acts ascend to heaven and bring down upon the nation the blessings of plenty and peace. *Mr William Fox.*

the whole, each paying in proportion to the number of acres of his property inclosed, this great plantation would raise such a forest, as would shelter the bleak country around it and be productive of a vast return: And although pine woods are not esteemed beautiful objects, yet they certainly are as pleasant to the eye, as gloomy heath.

Any grafs within the confines of this moor is no doubt let to the tenantry, by whose farms it is surrounded, and they probably may have a privilege of casting fuel upon it; but these servitudes might easily be compounded with the tenants, if the proprietors were in earnest.

At present every acre of heath is at an average scarcely worth a sixpence of rent; but let it be called one shilling, which is more than the value. If it were planted, we may reasonably suppose every tree grown to timber would in eighty years be at least worth five shillings. There are firs in this part of the country, planted between sixty-five and seventy years ago, which are selling at present from ten to fifteen shillings; and some of them bring twenty shillings: but allow eighty years for any difference which may be in soil or climate, and take only one half of the lowest price.

Suppose what might be planted of the moor in question, to be seven miles long and three miles broad, at an average. If the inclosure were a regular figure, having seven miles on two sides, and three on the other two, the bounding fence would be twenty miles long; but on the supposition that the figure be somewhat irregular, having exterior and interior angles, let the fence be called thirty miles in length, which is a large allowance.

The area of this moor, seven miles by three is twenty-one square miles, which are nearly equal to ten thousand seven hundred acres. Every acre will plant three thousand four

K k

hundred

hundred and twenty-two trees, allowing sixteen square feet to each. At an early period, which depends on the strength of the soil, and the progress of the young trees, one third should be taken out, when they begin to interfere; and each of the remaining trees will occupy twenty-four square feet. At a second weeding, when it appears necessary, another third of the original number may be cut down; and the remainder, being one thousand one hundred and forty, which are left to grow to timber, will each of them occupy a space of forty-eight square feet; which is sufficient for any ordinary fir. Many large firs grow vigorously in less room.

This moor is differently denominated from the properties of the gentlemen, who have an interest in it. For the sake of brevity I shall call the whole the moor of Orchill.

CALCULATION of the Expence and Profit in planting the Moor of ORCHILL.

PLANTATION Dr.

	£.	s.	d.
To rent of 10,000 acres, at 1 for 80 years,			
at 5 per cent. compound interest - -	519,607	13	10 $\frac{1}{2}$
An earthen fence of 30 miles, 6 feet high,			
at 4d. per yard, with compound interest			
for 80 years, at 5 per cent. - - - -	43,614	1	6
36,615,400 fir plants, at 1s. 6d. the 1000			
of 3 years old, with compound interest,			
at 5 per cent. - - - - -	136,103	8	0
Planting ditto, done by 6 men to an acre,			
at 1s. 3d. each per day, with compound			
interest, at 5 per cent. for 80 years -	198,865	6	8
	<hr/>		
	£ 898,190	10	0 $\frac{1}{2}$
	Two		

WASTES, MOORS:

255

PLANTATION Dr.

	£.	s.	d.
Brought forward - - - - -	898,190	10	0 $\frac{1}{2}$
Two foresters, at £ 20 each of yearly wages, for keeping the fence in repair, weed- ing, &c. with ditto interest, at 5 per cent. for 80 years * - - - - -	38,849	3	3 $\frac{1}{2}$
	<hr/> £ 937,839 13 4 $\frac{1}{2}$ <hr/>		

PLANTATION Contra Cr.

	£.	s.	d.
By 12,205,133 trees, 80 years old, being one third of the number planted, and valued at 5s. each - - - - -	3,051,283	5	0
Ditto number of weedings, taken out be- fore 20 years, and valued at one half- penny each, with compound interest, at 5 per cent. for 60 years, amounting to	474,955	12	0
Ditto number of weedings, taken out be- fore 30 years, valued at one penny each; for 50 years, at 5 per cent. comp. interest	583,163	5	4 $\frac{1}{2}$
Balance in favour of planting †	<hr/> £ 2,114,243 11 7 $\frac{1}{2}$ <hr/>		

K k 2

After

* In the formula, by which these annuities are calculated, S represents the amount of the annuity at the end of any number of years; a the annuity, r the amount of £ 1. at the end of one year; $r-1$ the rate of interest, and t the continuance of the annuity

$$S = \frac{ar \cdot r^t - a}{r - 1}$$

† Suppose that not $\frac{1}{3}$ but $\frac{1}{4}$ of the trees are left to grow to timber (being 855 on every acre, each occupying 64 square feet), still the balance in favour of planting will be £ 1,350,085 6s. 8d.

The

After allowing the value of the weedings to go for back-gone trees, and other contingent expences, not adverted to, which is surely enough, the profit is beyond conception, unless one were at the pains to make a calculation, which in the present case, it is hoped, has been done with all possible accuracy, in order to set this important subject in a clear point of view.

Were this plan to be adopted by the proprietors of this or other large moors, larches might be planted in some places, especially along the boundaries of different properties; and wherever the soil or the bleakness of the exposure is thought unfriendly, larches might thrive better than common firs, being the hardiest and the most valuable plant of the two. If there happen to be rivulets, ash would thrive on their banks, and elms, oaks or beeches on any dry spots of green ground. This variety would remove the dull sameness of the plantation and enliven the prospect. Eight or ten rows of spruces, as having of all trees the best shelter, by continuing, to any age, feathered to the ground, might be planted next the fence, to defend the whole plantation from sudden gusts or streams of wind. The expence on the plants might be, in a great measure, saved, and the trees rendered more congenial to the climate, by having the seed sown in the country; and three boys would suffice for three of the men, which would save one fourth of the expence of putting down the plants.

Whoever

The prime cost of the fir-plants is £2,746 3s. which may in a great measure be saved; and of planting £4,012 10s. of which one-fourth may be saved. After the first 15 or 20 years, the foresters will pay themselves out of the sale of weedings; and their wages may be saved entirely after the last weeding at 30 years.

Whoever has beheld the astonishing plantations at Cullen-house in the county of Bamf and at Monymusk in Aberdeenshire by the late proprietors of these places, and also by other heritors in different parts of the kingdom, who had a taste for improvement and understood their interest, will see the propriety of turning such moors as this, to account. It is not a mere experiment; it is not without precedent; it is no chimera. They have many patterns before their eyes. What a vast profit would arise from such an undertaking, besides the pure joy of giving bread to the persons employed and the pleasure of advancing and enriching their country!

That every possible chance of doing good may be embraced, and that persons, having small wastes, may easily discern the profit of planting such ground, it may be proper to accommodate the calculation to a small scale.

One acre of land at one shilling of yearly rent, by compound interest at five per cent. for the space of eighty years, is worth £48. 10. 11½. The same acre planted with common firs, and weeded down by various thinnings to one thousand one hundred and forty, and sold at the end of eighty years for five shillings each, would amount to £285. And if more valuable timber were planted, it would fetch more.

Whenever the land will not let at more than one shilling, or one shilling and sixpence, the acre, and is unfriendly to cultivation by the plough, it is by far the best method of turning it to account, to plant it full of trees suited to its nature. Even common firs in this way, will bring a sum equal to six shillings an acre of yearly rent; and moreover it is of no small consideration, that the most barren and bleak moor, by this management, will be rendered perfectly green; and if depastured by sheep, when the trees are cut
down,

down, it will remain green, and continue to let at a decent rent.

Were gentlemen of fortune to allot a small sum annually, perhaps from £ 10. to £ 50. according to their income, for raising plantations on different parts of their estates, the advantage to their heirs and to the public, would be incalculable in every point of view. Nor do I see any solid objection against it. It is in vain to reason with those, who will do nothing for posterity, because posterity has done nothing for them; as Swift expresses the argument of the slothfully selfish. The most plausible objection to this reasoning is, "That if all the low moors and other places not of the value of one shilling an acre yearly, and unfavourable for tillage, were planted, the country would be so much overstocked with timber, that it would give no price."* This objection might be got rid of by answering that so long as the value of an acre in planting was superior to one shilling of yearly rent, even the desire of *profit* ought to recommend planting; nor ought a generous man to regret that the public were served in timber at a more moderate price.—But this subject claims attention; and the following considerations are submitted to the reader. If the premises in the objection do not exist, the conclusion, being only hypothetical, must fall to the ground. There is little hope that all proprietors will plant their moors in any one generation, and therefore little danger that the country will be overstocked with timber. Their views, their taste, their mode of expenditure and many of their other habits are so extremely various, that there is no period, in which all or even a considerable number of them will adopt this mode of improvement.

The

* An objection made by a gentleman of large property in Fife.

The fir-woods on the shores of the Baltic are decreasing so fast, by the continual and growing demand upon them, that they have retired far to the inland parts of these countries; and the necessary land carriage, together with the freight, insurance and duty, has raised the price 50 per cent. within these few years; and if this goes on, it is difficult to say to what amount the expence of foreign timber may arise. If the price become excessive, and that there be no supply of native fir, the improvement of the country, in the article of building, which is so ornamental to it, will become stationary; none being able to afford the expence of lodging themselves comfortably, except the affluent and the great.

In countries at a distance from water carriage, where there is no pit-coal, and where the mosses are altogether or nearly exhausted, the inhabitants must feel the inconvenience of being in want of an article, which is so very necessary to their comfort, unless they have wood to burn. Some countries in England and many parts of the continent are in a deplorable condition in this respect. A supply of wood for fuel can never in these circumstances be plentiful, without extensive plantations on land which is unfit for grass or corn.

It is a presumptive proof that this country was warmer and the temperature of the air more mild, than at present, when our very mountains produced grain. This mildness of the climate was occasioned by nothing else, than the woodiness of the country at that æra. Restore the cause and the effect will follow. The more wood there is in a country, in northern latitudes, the more temperate the climate; and the more genial the influence of the air. Add to this, that in point of beauty, there is no comparison between a bleak moor covered with stunted heath, and a waving forest, clad with the livery of nature.

On

On the skirts of the moor of Orchill, there is a belt of sand, on which broom and furze are growing, particularly on the east, towards Auchterarder. The soil, in which furze is found, invites the industry of the husband-man, with an assured prospect of an immediate and abundant return. Where broom grows, the soil is lighter, and has for the most part, a gravelly or sandy bottom. The former is a good mould, and fitted for most crops. The latter is well adapted for turnips and red clover; and after resting a few years, will bear plentiful crops of grain; but having a weaker body than the former, it requires to be tenderly dealt with in cropping. Let not the husbandman be surprised to see these plants rise, even at the interval of fifty years or more, after they seemed to have been extirpated; for the seed of some plants remain long in the ground, without being deprived of the germ or vegetative principle.

Marl abounds in the country around this moor; and is well calculated to stimulate such soils. Nature has indeed provided, in most situations, some manure that will increase the fertility of the earth. Lime is now carried to that part of the country; and the numberless little rills, which descend from the moor, in all directions, after rain, would enrich the grass in many places, as may be seen in every little hollow between the hills. All these act indeed as a stimulus alone, which is mostly the case with every species of calcareous earth, of which they are entirely composed: but when argillaceous earth can be had at hand, it adds to the quantity of soil, strengthens the stamina, binding together the loose particles of such land as this, and thereby enables it to stand more frequent tillage.

From behind Culrois all the way to Blairingone, there are several tracts of waste and barren moor. The Earl of Dundonald

Dundonald has planted much, in this district; but more ought to be planted. In the moor between Gask and Mauderty, and all the way from Dollary on the west to the vicinity of Perth on the east, there are large tracts of stunted heath, that might be planted; and the stately plantations growing on some parts of this moor ought to induce the proprietors of other parts to follow the example. There is ground fit only for being planted, between Invermay and Newtown: and on the verge of the bank east from Aberdalgie to the great road. In the two places last mentioned, trees of hard wood, which are more valuable than firs, would thrive and come to perfection.

In plantations of fir, where the soil is tolerably good, young trees of hard wood, especially oaks and elms, may be put in among the firs, which protect them and do not much retard their growth by exhausting the soil: but care must be taken to cut down occasionally such of the fir trees, as interfere with their tops, by first lopping off the branches, and then laying down the trunk; which practice may be continued, until all the firs thought necessary to be taken away, are felled. In this manner one may have the benefit of almost two plantations on the same ground at once; the young trees being well advanced, before the older ones are taken out of their way. This practice is becoming more general every day. In other cases a belt of firs is planted round, to protect other trees in the middle of a plantation, without which precaution the interior trees, in certain situations, would be too much exposed; but this management is less to be depended, unless the ground be level, and the firs somewhat tall, before the other trees are planted.

On the higher parts of the Sherrif moor, near Dumblane, there are near seven thousand acres, calculated only for be-

ing planted. The lower parts of this moor are, in some places, cultivated; and the soil being deep, if it were drained, pared and burnt, might be improved still farther up, on the west side of the moor. The higher parts being planted with trees, and the skirts being reclaimed by tillage and grafs, would be an ornament, to a country which is naturally cold and bare; and that spot, which in the year 1715 was signalized by a victory obtained by the friends of our constitution in church and state, would now be a proof of the industry of their posterity and of the truth of Virgil's remark.

“*Scilicet et tempus veniet, cum finibus illis*

Agricola, incurvo terram molitus aratro,

Exesa inveniet scabra rubigine pila :

Grandiaque effossis mirabitur ossa sepulchris.” GEOR.

The vast fir woods already mentioned, which are growing naturally in Rannoch, besides others in Strathspey and elsewhere in the north of Scotland are raised much farther above the level of the sea, than any of those places recommended for plantations of fir in this report. The plantations of Lord Dundonald behind Culrofs and those on the Knock of Crieff are thriving on a soil as poor. These instances, and the fine plantation lately cut down at Turleum, behind Drummond Castle, a higher spot than any of them, may open the eyes of men to see what might be done on the Sherif moor, on that of Orchill, and in similar places, which at present are of very little value.

In many other parts of Strathallan; in all the tract between Dunblane and Callander above the arable ground; between the Port of Monteath and the bridge of Doune, on both sides of that moor, and in many other places, where the land is of little value, where the country is exposed

or wood scarce, proprietors would find their account in planting.

The vallies of the Highlands do not stand so much in need of artificial cover, as the Champaign country below. Their broken ground and the natural woods, which almost every where cover the declivity of these vallies, afford them abundant shelter : yet at the entrance of every opening into the highlands, there are extensive plantations ; and in various parts in their most inland Glens. From Dunkeld to the Castle of Blair, a tract of twenty miles, on both sides of a majestic river, the prospect is every moment diversified by alternate views of extensive woods and large plantations. From Logierait to Taymouth and even to Killin, it is impossible to enumerate the extent of the planting, where there was any defect of natural wood ; especially about the Earl of Breadalbane's Castle and on both sides of Loch-Tay, to the distance of sixteen miles. From the house of Auchtertyre, by Lawers and Comrie, to the source of the Earn, the taste and judgment of the proprietors' have been displayed by the variety of the trees they have planted, and the extent of waste land they have covered. At Gartmore, at Callander, and many other places in similar situations, the ingenuity of art has conspired with the beauties of nature to ornament the country with wood.

Besides the moors mentioned above, there are some other *low-lying* wastes, covered with a thin stratum of moss, on a bed of gravel, which produce nothing but heath ; one at Comrie, one at Dunira, one at Doune, one near Callander, and in other places. Mr Drummond of Comrie, who lately purchased Dalgarrofs, has boldly lined off streets and a market place through the very heart of the moor, fued out part of the ground, and the new settlers are going on with spirit,

to lay on new soil and otherways to improve one of the most barren spots in the country; and men will be enabled to live, where a few years ago scarcely a sparrow could find subsistence. Such are the effects of industry under the direction of good sense!

The moor in the vicinity of the house of Dunira has been reclaimed some years ago. Mr Dundas has planted the most barren spots, with a variety of trees suited to the soil: and wherever there was any depth of earth, the expence of cultivation has been rewarded by extensive and rich fields of grass. The plantations on the flat below will soon vie with the waving oak woods on the declivity of the winding hills and in the face of rocks, with which this singular place is surrounded.

In the vallies of the Seedlaw hills there are several spots of short heath, which are planted; but there are others of a better quality, which ought to be top-dressed with lime or marle, to raise a sward of grass. The climate in general is too unfavourable for raising much grain; but potatoes and turnips, succeeded by a crop of barley and grass seeds might grow in many places, which at present are totally neglected.

There is a common belonging to the town of Coupar, which consists of sixty acres; and another betwixt Alyth and Rattray, called the fore-hill, of more than one hundred acres; and another between Alyth and Jordantown, belonging to Lord Airly and the proprietors to the south, two miles long and one broad, within this county, which stretches also into the county of Angus, eastward, for two miles, with patches of arable land interspersed. The division of the moor of Alyth, has been three different times attempted by submission and as often frustrated by the death of the arbiters. At present it is again referred to the arbitration of

Lord

Lord Dunfinnan and another gentleman. There is much good soil in this common, and when it is divided, there is little doubt of its being reclaimed and making good returns.

Betwixt Easlie and Ketins in the same country, there is a waste of six miles in length and about half a mile broad at an average, which produces very little, except some bad pasture. It is almost a dead level, and a bed of sand, scarce worthy of being improved, by any returns to be expected from it.

The common of Rattry has been divided, but not improved. It is indeed very barren; but if it were wrought, it would produce turnips and then grafs. The moor of Blairgowrie is in a progressive state of improvement; and if persevered in, will soon exhibit a laudable specimen of the industry and intelligence of the proprietor. The great point is to bring such land as this to bear grafs; and after it is once green to depasture it with sheep, which in due time will thicken the sward, increase the vegetable mould and enable it to carry a few crops, in a judicious rotation.

The forest of Alyth has a good soil, but wants climate. It has lately been divided between Sir William Ramsay of Bamf, Mr Smyth of Balharry, Mr Morison of Naughton, and Mr Boyle of Tullymurdo, after a litigation of seventy years. What a vast expence would it save to the public, to devise a law upon equitable principles that would shorten these vexatious pleas, about the division of commons!

There is a large tract of waste land, which is not very high, along the ridge which stretches westward from the castle of Methven, on the south side of the river Almond. One part of this moor was a common, the division of which was referred to Lord Methven as sole arbiter, which is now divided to the satisfaction of all concerned.

Such

Such thin* moors, as the most of these taken notice of, are generally improved in various ways, according to the system adopted by different farmers. One improver says Pare and burn; then spread the ashes with a little lime; sow turnips, which ought to be fed off with sheep the first year. The second year plough again for turnips, and feed off in the same manner: then lay down with barley and grass-seeds. This mode of reclaiming moor, is recommended by a gentleman on the Nairn estate, betwixt Perth and Dunkeld.

Another gentleman on the opposite side of the Tay recommends to plough moor in winter; to let it lie in this state all next summer; during the course of the second summer, it ought to be ploughed from three to five times as may appear necessary. Then lime and sow with oats, the third spring; and against the fourth year lay down the ground with a crop of barley and grass seeds.—Some proprietors, who wish to be more expeditious, begin by trenching through the winter, at the rate of four pounds an acre, for a crop the succeeding spring. This is the practice between Perth and Coupar.

I have met with noted connoisseurs in agriculture, that have figured much in writing on the subject, who would pare and burn the thinnest stratum of moss on a subsoil of gravel or sand, according to a general rule, which they have laid down for treating all moors in the same manner. It is but fair to add, what they urge, in defence of their opinion: Not a particle of the soil can be annihilated by any operation of ours; the same number of particles remain after it is all reduced to ashes, which the soil formerly contained.

This

* Composed of the deciduous parts of heath on a subsoil of sand or gravel.

This puts me in mind of boys, who white a stick for a certain purpose, until it be so worn down that it become useless for any purpose whatever.

The opinion of other improvers of moor is, that the land ought to be ploughed and lie in that furrow for one year; that against the succeeding spring and summer, it ought to be cross-ploughed and harrowed, till the clods are reduced, limed the next autumn, drawn in ridges and ploughed for the seed furrow in spring. This method of reclaiming moors is recommended by a gentleman's factor in Strathcarn, and is very similar to the practice betwixt Perth and Coupar. Both have this to recommend them, that the quantity of soil is not diminished, where there seems to be so little to spare.

Mr Buchanan of Camfmore in this neighbourhood, who has improved upwards of five hundred and fifty acres of new ground of this kind, (which is as much perhaps as any other person in Perthshire has done,) lays lime on the surface in the summer or autumn, and leaves it generally for two or three seasons, spread in this manner, that it may sink into the ground and mix intimately with the soil. If the land has been well limed, the first crop will be tolerably good; the second heavy; and the land is by this time so well pulverized, that it is easily made for barley and grass seeds, the following year. In some cases, he interposes a fallow crop of potatoes or turnips, between the second crop of oats and the barley crop. By this management I have seen on his new ground the two first crops of oats remarkably good; the second especially, which exceeded six bolls an acre. His moors cultivated in this manner, where the ground was high, the heath as tall as a person's knee, and the soil not worth one shilling an acre in its former state, have continued

to carry grafs crops and let at between nine and ten fhillings of yearly rent, for the fpace of twenty years, without any future drefling, and without any fymptoms of the heath attempting to arife. Farmers may grudge to lofe the intereft of money laid out in lime, for the two or three years, before the land be in crop: but this is a fallacy; the intereft is not really loft. The foil is meliorated to fuch a degree, by the top drefling of lime, that the grafs raifed thereby does more than repay the intereft of the lime. Much expence is alfo faved, by ploughing only once for every crop of oats.

There is a certain barrennefs of foil, in which the heath delights; and whenever that barrennefs is removed, it does not thrive; neither does it thrive in the other extreme of the pooreft foil and moft expofed fituation.—To every plant there is a particular quality of foil, a certain degree of moifture, of warmth and expofure, which is natural. Different plants, as well as different animals, have peculiar climates, which are accommodated to their conftitution: and even in the fame country, one fpecies of plants is found in the valleys, and another in the hills; nay in the fame field and foil, if its nature and qualities be changed by cultivation, its productions will change of courfe. Allow your drains to flop in a field which had once been properly drefled; let it become four, fpouty ground, it becomes infantly filled with fprits, rufhes and other aquatics.

Drain and cultivate the fame field again; thefe coarfe graffes difappear, and others, which are peculiar to dry land, fucceed in their place. Fold fheep, lead rivulets, or lay enriching manure on the moft barren ground, which is not overcharged with water, and the richeft carpet of clofe fine grafs will fpring up fpontaneoufly. Remove thefe, before it
be

be fully saturated, and it will gradually return to its former sterility. Were all plants fitted by nature to thrive only in the same circumstances, we would have at least the half of the globe, without any plants at all; what might therefore appear, by superficial observation, to be a niggardness in nature, or a defect in the bounty of heaven, is, upon a closer inspection, recognized to be the effect of consummate wisdom and of goodness without bounds. From the frozen tops of the highest mountains down to the bottom of the warmest vallies, every degree of heat and cold, of barrenness and fertility, of wetness and dryness of soil, Providence has adapted to the nature of particular plants, which come to perfection, where another species could not live; and these various plants are the food of different animals, that no creature might be deprived of nourishment peculiar to its kind.

Without entering on that polemical point in agriculture, the *food* of plants, (which has been long a problem, and will probably remain, to be solved by future ages,) we may safely remark, that whatever is their food, they are taught by nature to seek after that food, which suits their kind. They uniformly reject other food; and, when forced, by the unskilfulness of man, to accept of food unsuitable to their constitution, they soon decay. It is therefore probable, that the food of all plants is not the same; but that some of them prefer one kind of food, and some another, and these in various degrees. At any rate, whatever their natural aliment is, or when the earth is brought by industry to have that aliment, *there* we uniformly see them making their appearance; and yet we cannot rightly tell how.

Instead of swelling this article to an immoderate size, I place in the Appendix, N^o 2 and 4, two important papers

relative to the improvement of waste land, one communicated by Mr Smyth of Balharry, the other by Mr Robertson of Lude, each from his own practice.

CHAP. XII.

IMPROVEMENTS.

SECT. I. *Draining.*

THE draining of land is a species of improvement much practised, and much desired where it is necessary, by all industrious farmers. Where the fields are horizontal, or where much superfluous water is to be carried off, open drains are used. In the upland where round stones are at hand, rumbling drains are most in use. The former kind prevails in the Carse of Gowrie, on the banks of the Isla, in Monteath and in many other places: the latter on the slopes of hills and in general in the Highland districts. When small flags can be got conveniently, the farmer builds two perpendicular walls about a foot high and covers them over with flags, having one row of turf, the green side down, and earth above all. Others throw round stones above the flags and below the turf. On the estates of Balharry and Jordanstown in the Stormont, the drains are all flagged in the bottom; then two side-walls are built and a second tire of flags laid on them. At Coupar drains are made by putting down two stones or stakes by way of props, opposite to one another, and at the distance of ten or twelve feet between each sett of props. The opposite props are four or six inches asunder, according to the quantity of water to be discharged.

discharged. A tree is fawn longitudinally into two; the flat side is laid on the props, and the whole covered over.—All these close drains are covered with straw or thin turf, or both, before the earth be thrown back, and are made of sufficient depth to allow the plough to pass over them with ease. The prices are various, from four-pence to six-pence the rood of six yards, according to their dimensions and the convenience of materials.

Much draining is still wanted in every part of this county; nor is it easy to say what is the good of land for raising any crop known in this country, nor what the benefit of manure can be, while the ground lies in water. As the knowledge of farming advances, there is no doubt, that draining will be also carried on. But if ground be incurably wet, and so poor, as not to defray the expence of laying it dry, to plant trees of the poplar kind seems to be the best mode of bringing it to some account. Any other trees will not thrive, without small cuts to carry off the water.

Draining and inclosing are not only essential, but permanent improvements of land; and therefore are the first steps taken, when the process is planned with judgment. For this reason the proprietor ought to execute them himself. If done otherways they are seldom effectual, unless the tenant be a person of uncommon spirit, and by the length of his lease, have a prospect of reaping the full benefit of these operations. If these improvements are carried on, during the currency of a lease, a certain interest may be necessary on the sum laid out; but when the lease is renewed, it is proper to add this centage to the aggregate sum of the rent, and to charge the whole under the general denomination of rent. A great number of items on a tack are odious things to the generality of tenants; because they consider every

thing as an imposition, or at least a grievance, except what they pay for the use of the soil.

Mr Campbell of Lochdochart, who has an extensive surface of swampy meadow; full of springs, in his estates in Glendochard and Strathfillan, told me that the b. ft drains for such land are made, by cutting the surface of each drain three feet broad, by digging down eighteen inches, with a slope that gives other eighteen inches at the bottom; and then by dividing the bottom into three equal spaces of six inches each. The middle space is cut down perpendicularly to the depth of six or eight inches and well cleaned out, so that it has the width of six inches both at the bottom and top, and six inches of firm ground for shoulders on each side. On these shoulders or abutments fods of eighteen inches in length are laid, with the grassy side downward, consisting of the toughest and stiffest of the original fods. Care must be taken to cut the fods very nicely and to lay them very closely together, that no particles may get down in any openings between them. When the original earth is thrown back, the drain is finished.

Others recommend, that, in place of laying the fods horizontally upon their green side, they should be laid down archways, putting the two first fods on their edge upon the abutments of six inches, with their red side outward, and one fod between them, put in like the key-stone of a bridge. When this arch is firmly clapped or trodden down, and the original earth thrown back, this drain is complete.

In many situations, that might be pointed out not only in this, but in other counties, where field-stones are scarce and the expence considerable, of bringing stones from a distance to fill up drains, which generally happens in swampy plain ground, either of these kinds now described may be adopted;

ted; and in a clay soil or where the land is otherways of a strong and stiff texture, if the drains are made carefully with green fods, they will continue clear for a long time.

If the Board of Agriculture has paid Mr Elkington for the discovery of his method of draining, of which so much has been said, and from which great advantages are reaped, a full account of it should be laid before the public, in a pamphlet or otherways, that the nation at large may have the benefit of adopting it, without the trouble of sending for that gentleman up and down the country and paying him a second time.

All water must descend, when left to its own impulse, by reason of its fluidity and gravity; and its descent is in a direct line to the center of the earth, unless it meet a force which turns it obliquely, or such resistance as makes it stagnant. Water on the surface or in the bowels of the earth is diverted from its natural course by strata of till or rock or some other resisting body. If on the surface, it forms ponds; if in the earth, it continues to descend along the surface of the resisting body, until it be thrown out upon the surface, unless it meets in its subterraneous course, either fissures of rock capable to receive it, or a spongy substance, or most commonly a bed of sand. Into any of these, especially into the last, it can penetrate with ease and follow its natural tendency by means of gravitation. Spongy bodies are not frequent in the bowels of the earth, owing to the pressure from above, or if they are there, they are filled with water. The fissures of rocks are seldom perpendicular and seldom large. They are generally oblique, in which case they throw out the water. But beds of sand are frequent there. If therefore water could be conducted, either above or below the surface, to a stratum of sand or gravel, there is no doubt

doubt of its sinking into the earth, not to appear again, unless resisted by a stratum of till or rock below the sand.— From this principle we may infer that all tilly land, and all land on rock must be spouty; which we see to be a fact.

SECT. II. *Paring and Burning.*

PARING and burning was formerly more practised in this part of the county, than it has been of late years; and in the eastern districts, I did not learn, that it had ever been much in use. The best farmers say that the oleaginous parts of the surface, whether plants or earth are dissipated and lost, in the operation of burning, and that only the earthy parts remain. This cannot be denied; and is a material objection to that mode of cultivation in many cases.*

Where there is a deep soil, with a crust of fungous moss, tough bent, matted rushes, or turfy peat-earth on the surface, burning is unquestionably the best method of improving; but when the soil is thin, burning, which certainly lessens its staple, occasions an injury equal to any advantage received by laying on the ashes. My own opinion of burning a light soil has been given already, and I find, by the notes taken down upon this article, that the general voice is against paring and burning that kind of soil, whatever should

* The objections to paring and burning have almost entirely arisen from its being principally practised with a view to a system of scouring crops; and where marle or lime are used for the same purpose, they deserve equally to be reprobated.

Paring and burning will do more in one year towards bringing good grass, or providing for a green crop, and a subsequent good rotation, than can in most situations be accomplished in five or six years with lime or marle, I mean in point of extent, because as much paring and burning can be done in one year as is wished. *Sir William Murray*

should be done, if the sward was strong and the soil of sufficient depth.

It is a great error in burning the surface of land, or any vegetable substance, for the sake of ashes, to allow the sods to be very dry, before they are set on fire. When they have just attained such a degree of dryness as to burn slowly, they will produce the greatest quantity of ashes. If the kilns be fairly on fire with some dry materials, there is little occasion to dry the additional sods at all; they will dry gradually as the fire approaches them; and there is the less danger of flame, which in all cases ought to be prevented. The ashes ought to be spread while they are dry.

Some farmers in this county expressed a desire that the Board would send a person skilled in paring and burning to different parts of the country, in order to point out what soils are best adapted for this species of improvement, and to instruct them in the way of carrying it on.

SECT. III. *Embanking.*

AT the junction of the Earn and Tay, Mr Somerville, a spirited farmer, has banked off the river, an island of twenty one acres; and has made a road two chains long, between this island and the main land, through a depth of twelve feet at low water. Six feet of sileech had, in the year 1793, gathered in the bottom of the gulf or creek, where the water stagnates; and in a short time, the island will be annexed to his farm by a tract of solid land. He has also banked about a mile on the sides of both rivers, where the shore was low, and the land exposed to inundations. This bank is six or seven feet high at an average, corresponding to the rising or falling of the surface on which it is made, and from fourteen to thirty feet in the base; the whole at
his

his own expence. Lord Wemyss has, near the same place, made a battery of stone, to join another island to the main land.

The river Earn overflows the land not only at its mouth, but in many other places, from Comrie down to the sea. It makes the greatest havock from the bridge of Kinkell eastward, where its inundations are in some cases nearly a mile broad; yet I did not observe that in this tract any means had been used to lessen its depredations.

When I was in the Stormont in autumn in 1795, the Isla had spread so far, that the bridge at Coupar was impassable. The river in a few years will force its way at one end of that bridge, unless it be prevented. The Teath and the Forth overflow their banks less than any other rivers in the county, except the former at Callander and Balquhider, and the latter at Aberfoil.

It is an object of importance both to heritors and tenants, to endeavour to defend the soil and the crop from these destructive inundations; and there is little doubt, that they often lose in a season or two, as much as the expence would amount to. Piers of stone are sometimes made; but this is liable to an action for damages, at the instance of the opposite heritor, unless a river be very broad; it is not in every place that stones are at hand; and the stream often recoils with double force from the opposite bank upon the place immediately below the pier. Sometimes large creels are made and filled with stones; but if the tract be long and the timber scarce, this bulwark would be expensive and at best only temporary. Where large stones and of a sufficient length can be got for the front, nothing is superior to a bulwark of this kind, rising with an angle of between forty five and thirty degrees from the plane of the horizon. Where the
current

current is very forcible, the angle ought to be less; where it is less rapid, it may be greater. It may serve the same purpose and be much cheaper, where stones are scarce, to raise a bank of earth, somewhat higher than the water mark in the highest floods; which must be mathematically constructed. But the danger arises from the river undermining these banks, and rendering them of no avail. The only precaution in this case seems to be, to erect the bank at such a distance from the brink of the river, as to make an allowance for the increase of the river in time of flooding. The foundation ought to be dug down, where the bank is made, considerably below the surface of the ground: if near the river in any place, it ought to be as low as its bed, especially if the current be strong; and the slope ascending backward in the form of the glacis of a fortification. The bank ought not wholly to consist of earth or gravel. Furze or juniper or heath (but no broom, nor any branches of trees, which are apt to rot) should be laid carefully among the materials, always pointing to the river and sloping downward; beginning at the bottom of the slope and ascending backward to the summit of the bank. If the outermost stratum of the declivity were made of tough sod, taken from some neighbouring bog, and the seams well clapt together, and the front planted with osiers, this embankment has been known to resist a very impetuous stream; because the resistance is gradual, the declination corresponding to the strength of the current, the surface on which the pressure is made, is more enlarged, and water is known to press, not according to its breadth, but according to its altitude.

Wherever embankments are deemed too arduous an undertaking, and where the hay or corns are in danger of be-

ing carried away by floods in the autumn, hurdles, (vulgarly called stake and rice) may be made round the links, and along the banks of rivers, somewhat open below, to afford an easy passage to the stream, and close wound above, to stop the floating grain.—This expedient is recommended by a gentleman in this neighbourhood lately from abroad, who has treasured up agricultural knowledge by observing the practice of farmers in both hemispheres.

SECT. IV. *Trenching.*

THE trenching of land in the open fields, where it is coarse and full of stones, is not so expensive as is generally supposed, if the profit arising from it is taken into the account. There is no other method so effectual to reduce the stubborn soil of waste land to a proper mould, to pick out the stones, which might be troublesome in future operations, to discover the subterraneous springs and lay it perfectly dry. This practice is much followed in the neighbourhood of Glasgow, and was introduced into this district of the county of Perth by the late Thomas Buchanan Esquire of Leney. It is at present practised in reclaiming waste land betwixt Coupar and Perth, and in various other parts of the county. An improvement, which, upon a superficial view, may appear to be the most expensive at first, is frequently the cheapest in the end, because it is complete at once, and needs not to be repeated. In fields of ordinary difficulty two crops will repay the expence of trenching, at the rate of four pounds the acre, which is the common price; and near a gentleman's place, a piece of untoward ground, which he is resolved to dress, cannot be improved with equal success in any other way.

A Sketch of a Machine for raising large Stones, with a description, and directions how to use it.

THIS machine is uncommonly useful, when a field is to be cleared of large stones, in not only saving a great expence of boring and powder, in avoiding the trouble and danger of blowing, but also in abridging the labour of raising them into carts or waggons; since three men will, by means of the pulley and cylinder, lift a block to any necessary height, with more ease, dispatch and safety, than ten or more men in the ordinary way. It has a striking resemblance to that used by wood-cutters in weighing their bark, called a triangle.

The three legs ad , bd , and cd , are beams of any hard wood, four inches thick, six inches broad, and about fourteen feet long. Their thinnest side points inward, which gives them more strength. Their feet form, on the ground, an equilateral triangle abc , and their three tops at d are fixed together by an iron rod, which passes through each. The two legs ad and bd are fixed to one another by the windlafs k , and by the cross bars opq . There are two pullies e and f with an iron hook of two inches in circumference to each; ggg may be (more than one, but rather) one iron chain, which goes round the stone n , while lying in the ground at m , below its greatest diameter, or where it begins to become narrow. This chain consists of rounded links, which are about three inches long, and about the thickness of a man's little finger. It has a hook at one end, that may be put into any link towards the other end, which will make it embrace the stone exactly, and be of the same circumference, where the stone touches the earth; hg , hg , hg , are shorter chains of the same workmanship, whose

hooks are fixed into links of the surrounding chain at *g, g, g,* and so on round the stone, having the corresponding link of each fixed on the hook of the lower pulley at *b*. The whole rope must be of the same thickness with the two great hooks, two inches in circumference.

All things being thus prepared, two men turn round the handles of the cylinder, and the waggoner assisting them by applying a lever to any side of the stone that seems to be firmest, they force it aloft, and hold it at the proper height, until the driver put his carriage backward between *b* and *c*; which carriage ought to have a strong frame upon four low stout wheels. Then the stone is let gently down and carried away.—A gentleman, whom I have often alluded to for his knowledge in every department of agriculture, has employed a machine of this construction, with great success, in the parish of Callander, for a considerable time, raising stones of several tons, which astonish every person who had never seen a similar operation carried on.

SECT. V. *Manuring.*

WHEREVER the earth contains the greatest quantity of putrid matter, either from animal or vegetable substances, that is the richest soil; and it is rich or poor in the proportion, in which it contains more or less of these in a state of decomposition. Hence the astonishing fertility of all new soil, or what is called virgin earth; which is the only circumstance that gives probability to the accounts we receive of the produce of newly discovered countries, where the soil has since the creation been acquiring an accretion of vegetable food, without losing any by being depastured or by cropping.

Although

Although plants cannot be classed under the denomination of manures, yet the tap-rooted and the legumenous tribes, by their effect in meliorating a soil, deserve to be taken notice of under this article. The first class penetrate below the surface in quest of nourishment, while they exhaust very little of the vegetable food in the upper stratum. They tend to enrich the ground by their spreading foliage, which retains the dews, and have a fertilizing influence by being frequently hoed. Turnips, parsnips, carrots, clover, cabbages and coleworts are of this class. Equal to any of these is the potatoe, because it swells below the earth, stirs the ground and penetrates downward for its food. To the second class belong the various kinds of pulse, such as beans, pease, tares, &c. Although they adhere to the surface of the land, especially the two last, yet they choke weeds, retain dews, and by covering the ground, prevent the sun from exhaling the moisture and parching the earth.

1. The use of dung is so universal, and its effects so powerful that it is unnecessary to dwell upon the propriety of increasing the quantity by every possible mean. Besides dung in its crude state, which every farmer uses, there are a great number of compost dung-hills or mixens made within the limits of this survey. Some farmers mix lime and earth and dung; others mix lime and earth; and others dung and earth. Some turn them in the beginning of spring; and others not. But they ought all to be made nine months at least, before the manure is to be laid on the land, and turned either before or after the winter's frost, to increase the fermentation.

The use of compost dung-hills in general, is in proportion to the industry and intelligence of the tenantry. The indolent never think of them; the diligent collect all the useless
trumphery

trumphery of vegetables they can command, before the feed upon them has ripened, mixed with quick lime, to increase the quantity of dung, knowing that this will increase their quantity of grain. It is proper, however, to take notice; that about Abernethy and some other places, there are spirited improvers, who in place of making compost dung-hills, lay on every manure separately.

In making these mixens, that soil is preferable, and ought to be introduced upon a field, which consists of a quality opposite to the field itself.

2. Lime is a manure in general use, where the price and carriage are in any degree moderate, or where there is fuel to burn it. If it be distant, the farmers endeavour to carry it in shells, while the water is dissipated and the lime light. It is always an object worthy of attention to remove the shells as soon as possible, after the lime is drawn from the kiln; for it is known from experiment, that a ton of lime exposed twenty-two days to the air, after calcination, is augmented in weight to thirty hundred weight, and some kinds of lime even to thirty-five, which is little less than double. This I think is the result of an experiment made by the learned and good Bishop Watson of Landaff.

Raw limestone, beat small, makes an excellent manure, and might supply the place of calcined limestone where fuel is scarce. In Rannoch, a district of this county, very remote from coal, a machine was erected by the late commissioners of annexed estates, for this purpose, which was driven by a stream of water. Mr Stewart of Crosmount, who saw the machine, the pounded limestone and its effects on the land, favoured me with the following remarks. "There were two pounders, and a third was afterwards added, all from Carron, at a small expence. The pounded lime was

carried

carried from the machine by a small run of water to three different ponds, one above the other. The upper pond contained the grossest particles, and the lower pond the smallest or finest part of the limestone, which resembled clay or marle from its smoothness." The middle pond contained what it would appear Mr Stewart thought to be properly pounded; because he adds, "the run of water might have been stronger, which would have enabled the miln to double the quantity grinded, which would serve the purpose of manure equally well, if not better, than by being pounded so very small. All that was pounded, before the machine was carried off by a flood, or the most of it, was used by Colonel Alexander Robertson, uncle to the present Colonel Robertson of Struan, who had a farm in the neighbourhood of the miln. The effects of it were visible upon the ground, which were shown by the Colonel to different gentlemen and approved of."

It seems, however, that before its virtues could be fully ascertained by repeated and varied experiments, a torrent in the brook that drove the miln, carried all the machinery away, or at least deranged it so that it was never restored. There is little doubt of its beneficial effects on land; or of its effects being more powerful in one shape or other, than those of the same quantity of calcined limestone, because the virtues must be in proportion to the quantity of calcareous earth in each. Any given quantity of raw lime loses one third of its weight when burnt into shells. Nothing is dissipated except the water. All the calcareous earth remains. It is also found, that any given quantity of shells produces double that quantity of powdered or slacked lime. Therefore a quantity of raw limestone, a bushel for instance, has double the quantity of calcareous earth which is in a
bushel

busnel of slacked lime; consequently its influence, as a manure, must be double.

What is commonly supposed, and I think with probability, by those who used both kinds, without making any accurate experiments, is, that the effects of the raw lime are slow, but more lasting, of the calcined lime more immediate, but less durable. Lime in every state acts as a stimulus, but its power to stimulate may be influenced by the state in which it is applied. These seemingly opposite qualities may therefore depend on the superior attraction of quick lime, absorbing the influence of the air more speedily and more copiously, and thus communicating its virtues to the soil much faster than the raw lime can do.

When the Board of Agriculture find themselves at leisure, from more pressing business, it is highly worthy of their attention, to ascertain with more precision, than seems hitherto have been done, the effects of raw lime as a manure; and if it be found, upon trial, to possess such qualities as are alleged; there is little doubt, but they will devise a proper machine on the principles of a mill for fulling cloth or of that for bruising lintseed, only substituting iron for timber, both in the stamps and trough; or in some similar construction. There is so much country, not only in this shire, but in many others throughout Scotland, which abounds in limestone, but is so scarce of fuel, that there is hardly a national object, relative to manure, which ought to make a stronger impression on the mind of the Board.

Farmers, in the east end of Strathearn, carry lime from the shore of Perth, from Forthar, and from the Lomonds. Lord Elgin's lime is sold at the shore for one shilling and eight pence the boll; that from Sunderland at two shillings; and that from Bruntisland at two shillings and two pence, all

wheat

wheat measure. The lime from Forthar costs three shillings and six pence the boll; and that from the Lomonds three shillings, Linlithgow measure, when carried three miles beyond Abernethy; the shore lime costs two shillings and four pence, carriage included, to the distance of six miles from Perth. The quantity of lime imported at Perth, and the annual increase of that quantity, may be seen in the table of exports and imports at that port, which is subjoined to this article.—Nothing can be a clearer evidence of the progressive improvement, and of the progressive prosperity of the country, than facts of this nature. They must carry conviction home to every mind.

The lime from Perth is carried far up through Strathearn, till it meet the lime from the shore and neighbourhood of Stirling. About Fullyallan and Culrofs, the farmers use Lord Elgin's lime, which is purchased at the kilns for ten pence halfpenny the boll. About Fossaway and Muckhart, lime is found in the neighbourhood. At Stirling the lime sells for eight shillings and six pence the chalder, pease measure, or ten shillings Linlithgow measure; and is carried into all the district of Strathallan, and the greatest part of Monteath.

Lime is the only artificial manure which is used in the Carse of Gowrie, and is imported at the different villages along the frith of Tay. Mr Donaldson, in his account of of this district, says, "that it appears from a correct statement, on an average of the seven years immediately preceding 1794, that there have been annually imported into the Carse 24,000 bolls of lime shells, each boll measuring four firlots, wheat measure, which at one shilling and six pence the boll, makes the sum expended for this species of manure by the proprietors and tenants amount to L. 1,800 sterling yearly; a circumstance, which evinces in the clearest man-

ner, to what a height improvements in agriculture are arrived in that part of the country."

Lime is found at Callander* and Aberfoil. That at Callander on the property of Mr Hamilton of Bardowie, which has been the greatest and first means of improving this part of the country, continues still to be wrought; that at Aberfoil, on the property of the Duke of Montrose, has been interrupted of late by a great quantity of rotten rock which fell upon the vein of limestone. The former is a beautiful marble, having a deep blue ground, finely variegated with streaks of pure white.—It is well known, that all marble is composed of calcareous earth, and makes lime; but all limestone is not marble.

A quarry of limestone has been lately opened on the side of Lochearn, on the property of the Earl of Breadalbane; and when carried by water to the east end of the lake, the shells are sold at two shillings and twopence the boll, and the raw stones at seven shillings the chalders: a great boon to a country, which had no access to lime formerly. Its effects are already visible over the face of the country in the vicinity of Comrie. As this quarry is inexhaustible, crossing below the hills to the west end of Loch Tay, to Glenlyon and Rannoch, and appearing above ground in many large rocks, were it not for the scarcity of fuel, such a store of limestone would be of great utility to all these countries.

The

* Besides the lime on the estate of Leney, a mile westward of Callander, another fine quarry is broke open in the Breas of Leney, belonging to Lord Perth, *idem ignotus*.

It is so far a *fine* quarry, that it has been given up, as not worth the expence of working, by the most enterprising, who is also one of the most opulent men in that country, who had taken it, although it cost him no rent. This critic's facts are not better founded than his opinions.

The same chain extends southward to Balquhadder and Strathyre; and the farmers, after breaking it to the size of a turkey's egg, burn it frequently with peats and timber. Mention has been made already of the incalculable advantage of constructing machines for pounding raw limestone, in these and similar districts.

In many instances the kilns made by country people for burning limestone to be used on their own farms, are very awkward. We ought not, however, to brand them with opprobrious epithets, nor rail at them with acrimony of language; which is sometimes done; we ought rather to be glad that they make any kilns at all, and point out to them a better form of a kiln. The best model of a kiln for this purpose is in the shape of an egg, with the small end downwards, and the opening above somewhat larger than the bottom. The best situation is in a declivity, with the mouth very little, if at all, above the surface on the back part. Kilns of this construction, and in this situation, require less fuel and are more easily filled than any other.

The quantity laid on stiff land, by skilful improvers in the low country, is from forty to fifty bolls to the acre; on light land, with a gravelly subsoil, thirty or thirty-five bolls are accounted a sufficient dose. In some parts of the Carse or clay land, which is not easily stimulated, they lay on eighty or ninety bolls. It is sometimes laid on fallow, immediately before the seed furrow; on barley and grass seeds either before or after the barley is sown; and in some cases with the preceding crop, where turnips are cultivated, to prepare the ground for barley. Lime is in some instances mixed in compost dung-hills, in others it is spread on the green sward, before the land be broke up from grass. One infallible maxim with regard to lime is, that the longer it is kept near

the surface, at least within reach of the plough, until it be intimately mixed with the soil, and its virtues imbibed, so much the better. The first liming of land has always a more powerful effect, than it has at a future but no distant period, the quantity being equal.

There may be principles of vegetation in the earth, corresponding to the different stimulating manures; and when these are acted upon, and exerted by the application of a particular stimulus, the earth may require an interval, longer or shorter, according to the exertion it has made in any instance, to recruit the exhausted principle of fecundity, adapted to the new stimulus. This is a law of nature, to which every class of animals is invariably subjected: what influence it may have on the productions of the earth may not be so easily investigated.

Quick lime intended for wheat, after a fallow, or for barley and grass seeds, might be ploughed in with a very shallow furrow, before the seed is sown: for oats after ley, it ought to be laid on during the preceding autumn; and for pasture or a top-dressing, early in spring or in autumn, rather than in summer or in winter; because if the summer be dry, the grass is burnt up by the lime, and in winter its virtues are lessened by the frost, nor does it so powerfully attract the influence of the air.

There is nothing more common, and perhaps few things more difficult to be accounted for, than when lime is spread on short heath, or other barren ground, which has a dry bottom, to see white clover and daisies, rising spontaneously and plentifully, the second or third spring thereafter, where not a vestige of either, nor even a blade of grass was to be seen before.

The

The feeds of some plants have wings, and when fully ripe, they spread their sails to the wind; the feeds of others have long beards, which make them buoyant and raise them aloft in the air, in quest of a new settlement: but it is vain to suppose that the heavy globular feeds of clover and daisies, without beard or wings, are wafted about by the winds; it is also absurd to say, that they are brought there in the lime, after it has been burnt; and it is equally so, to alledge that they are deposited from the stomachs of birds, without having been digested, as stone-feeds sometimes are, or that birds would pitch upon the very spot, where lime or other enriching manure had been spread, to deposit *there* the white clover and daisy feeds in such quantities, and in no other place near it, nor at any former time.

Suppose a field to be well drained, and in consequence of that operation to carry the richest and finest grasses. If any one of the drains shall stop, rushes, sprits and other coarse grass, peculiar to spouty land will grow apace. Why does this coarse grass grow only at the drain that has ceased to flow, where the land is overcharged with water? Why does not the same grass appear in the tract of the other drains, where the water is carried off? Or if the feeds of these coarse grasses are sown by birds, why are they not sown in dry land, which birds frequent, rather than in a bog, where few of them alight? Unless one can give a satisfactory answer to these difficulties, the sowing of clover and daisies, of sprits and rushes and of every other species of grass, by birds must be given up.

Lastly it is altogether unphilosophical, and contrary to common sense, to have recourse to the doctrine of equivocal generation, by imagining that any thing can produce itself, or that the seed of grasses can be produced without a cause.

This

This doctrine is universally exploded. No man will hold it, who does not wish to be thought to have bid adieu to his understanding.—Many difficulties occur relative to the generation of animals as well as plants; but to those my subject does not lead me. We are surrounded with mysteries on every hand; and many things both in the material and intellectual world appear inexplicable to us, owing to the shallowness of our understanding. The ways and the works of God are dark and intricate, and we often attempt to investigate them in vain. Our most profound researches are frequently nothing better than guessing at the causes of the phenomena that appear in the course of providence. There is no harm in these conjectures, if we hold them with humility.—Perhaps the seeds of all plants were created at the same time with the earth itself and deposited in the ground, to remain *there*, until they are called forth by that degree of fecundity in the soil and warmth in the sun, together with the moisture and exposure and other circumstances, which correspond to their nature.*

3. *Marle*. All the different kinds of marle partake of the quality of lime, and act on the soil nearly in the same manner. Stone and clay marles are slower in stimulating the ground, because they require longer time to fall into powder. Calcareous marle is somewhat quicker, but shell marle the quickest of all. Marle as well as lime being a stimulus, ought not to be repeated very often: the land will soon be exhausted, unless it either have time to recover itself, by
lying

* Every effort of human industry in the course of virtue receives the blessing of the Almighty Ruler of the Universe: hence barren spots bring forth verdure and adorn the earth—Grateful for the effect, let us adore the cause, to whom we owe our being and the heartfelt happiness of obedience to his holy laws. *Mr William Fox.*

lying out, or otherways receive a supply of vegetable food. The danger of exhaustion is however greater, when the land is naturally light and easily stimulated, than when it is heavy, sluggish and stiff.

Limestone will effervesce with aquafortis, but will not dissolve in water. Marle will both effervesce and dissolve. The best marle will effervesce most powerfully.

Shell marle, which of all others abounds most in this county, contains more oil, than any of the other kinds. In common with them, it pulverizes the soil, and prepares the vegetable food for being absorbed by the roots of plants: in common with them also, it communicates to the soil the power of attracting the fertilizing influence of the air: but it surpasses them, by adding mucilaginous matter of its own to the soil, being the exuvæ of animals, and thereby increases in no small degree, the quantity of vegetable food.

Shell marle is found in many parts of Perthshire, in great quantities: in Strathearn from Auchtertyre to Gask; at the head of the Allan from Gleneagles to Ardoch; every where in the Stormont. In Monteath none has hitherto been discovered, except a little some years ago at Kier. In Strathearn it is sold from eight to ten pence the boll, being eight cubical feet. The ordinary allowance for an acre is from forty to sixty bolls. A gentleman on the Nairn estate betwixt Perth and Dunkeld told me, that the farmers in that district go even the length of one hundred bolls to the acre; but the most of the land in that country is a deep strong loam. The most experienced improvers allow forty bolls, for a second marling, after an interval of fourteen years. The interval now adopted in the Stormont is nineteen years, especially on the estate of Balharry and the country adjacent. On all light land its effects are powerful and immediate; but

it

it requires to be managed with caution. Many places of the Stormont and indeed in all Strathmore have been almost laid waste, by the excessive application of this stimulating manure and over-cropping the ground. At Bradiston the soil lost all the power of cohesion and became so light by this cause, that it had no sward; the surface and the soil were blown away with the winds, in the same manner as dust is raised from the roads; and dens were made in some instances to the depth of five or six feet. About Bakie, along the road from Coupar to Meigle, and in many other places, the same injury has been done to the soil, by the injudicious use of marle. I saw one field west of Blairgowrie, which had been so reduced, that after it had lyen fourteen years or more in grass, it had scarcely gathered a decent sward. Mr Smyth of Balharrie, to whom I owe much of my information relative to that country, told me that the land of Fullarton had been marled every second year for a succession of ten or twelve years, which at length put the ground from carrying oats, but not from barley; which management and effect still continued in 1795. This fact seems to indicate that oats will exhaust marled land more than barley; or that the dung given to the barley crop corrects the exhausting quality of the marle.

The first marle discovered in Strathearn was in the loch of Auchtertyre: and it has been applied very successfully to the lands in that neighbourhood, for a long time, because a succession of scourging crops is not allowed. No such consequences have followed as these in the Stormont. The expence of dragging it out of the loch amounts to three-pence the boll, and a stratum of moss from nine to sixteen feet, must be removed, before the bed of marle in one end of the lake can be wrought. Sir William Murray showed me a
field

field of thin gravelly moor, laid down with marle alone, every acre of which, by such a dressing was equal to the maintenance of four sheep. In some parts of the same moor, which had not been ploughed at all, the heath was banished in three years by a top-dressing of marle, and succeeded by a fine close grafs.

Shell marle is found for the most part in small lakes or in land-locked bogs and mosses, where there had been formerly a lake or pond, during the multiplication of the animals. The wilks, which produce the marle, live only one year and multiply prodigiously. They are often found to adhere to the long grafs, which grows in pools, where they breed; and when the grafs decays, it is laid in horizontal lamina on the marle bed, by the weight of the animals. These lamina ascertain the number of years, in which the marle-bed has been forming, in the same manner, as the rings of trees denote their age.

When the wilks* happen to generate in springs or other small collections of water, which are in moors or other high ground, they are frequently carried down, in the wet season, to the first still water; but if the stream is not able to carry them to a pond, they are sometimes left in the face of hills, and form beds of marle in that situation. In Glentilt, a property belonging to the Duke of Athol, there is marle collected in this manner, on the declivity of a hill, to the depth of thirty feet, which, at a distance, has the appearance of a white rock.

These wilks are of a blackish colour and about the size of a pea; and are found in rills or springs in the months of May and June, sticking to stones and grafs. Wherever the

P p

wilks

* An English gentleman, whose name I have forgot, says that not only wilks but bivalves produce shell marle.

wilks are observed in lakes, bogs or meadows, it will be proper to bore for marle; or if they be found in spouty land, or in rills of water that flow into lakes or into marshes that stagnate, it may be also proper to bore for marle in these lakes or stagnant water.

The boring rod or wimble is made of iron, in pieces of about four feet long, which screw into each other. In the undermost or first piece is a kind of tube, about two and a half feet long, pointed sharp, open on one side, and one of the edges raised higher than the other, like a gimlet; so that when turned round, it may fill itself with the substance which surrounds it. Into this tube, which is open at the top, is put a piece of wood, as long as the tube itself, and of a conical shape, corresponding exactly to its figure. To this piece of wood is fastened a rope, of the size of one's little finger and longer than the whole rod, when all the pieces are put together. This piece of wood must stick so fast as not to come out, when the rod is pushed down into the earth or moss, below which marle is expected to be found; but must not be so firmly fastened, as not to be easily drawn out by the rope, to which it is fixed.—When you wish to bore, put the piece wood into the tube; screw the piece of the rod, which is fitted to the screw, on the top of the iron in which the tube is formed; then push down the rod into the earth or moss, allowing the rope to go down with the rod, without twisting round it: and when these two first pieces of the rod are pushed down, their full length, screw on the upper piece of the rod, which ought to fit the screws of all the other pieces, and must have a hole in the top of it, large enough to admit of a piece of timber, two inches diameter and four feet long, with which you are to turn round the rod three or four times, having
previously

previously drawn up, with the rope, the piece of wood which had been put into the tube. When the tube is thus turned round, it will be filled with the substance next it; and when drawn up, will show what that substance is. You can bore deeper and deeper, by screwing on more pieces of the rod, below the piece into which the handle is received that turns it round; but for facility in unscrewing, there should be a hole in every piece of the rod, that will admit a piece iron, of the thickness of a man's thumb and eighteen inches long. It will be necessary to have two of these pieces of iron, so as to hold the rod steady with the one, while you screw or unscrew any of the pieces with the other; and this must always be done, in putting down and taking up, when a great length of the rod is required, as it cannot be managed in either of these cases, all in one piece.

Marle has been found under almost every kind of substance, but the most common are moss or soft mud or sand; more rarely under clay or gravel. The methods taken to get out marle are draining, pitting, throwing out or pumping off the water, or dragging it into boats and emptying the load upon piers. Shell marle is white or yellowish and is nearly equal in value to lime, being by far more powerful than clay marle.

It is the general opinion that marle is little known in England, where it is sometimes called snail-cad, because the wilks, that form it, are a small snail. There is great abundance of marle in many parts of France, where its use is hardly known; it is not improbable that their system of husbandry, which in general consists of a succession of scourging crops, may have brought marle into disrepute; because it is a common French proverb, *That marle is riches to the father, but ruin to the son.* This may be applied to every stimulus,

which is laid upon the soil, when followed up by scourging crops.

4. *Moss*. Moss, which hitherto has been little tried as a manure, has a better effect than most people are aware of. The first that is said to have been used in this part of the country, was by Miss Jean Graham of Duchray, who managed the estate, and the family-farm of Rednock-house, while her two brothers were engaged in defending their country in the war preceding the peace of 1763. This lady told me that she had in various instances employed moss as a manure with success. Miss Graham was among the first persons, if not the very first, who pared and burnt mossy ground in Monteath. Several acres, which had undergone this operation by her directions at that early period, continue to carry a close sward of green grass at this day, without a single pile of heath arising.

The proprietor and some of the tenants at Auchtertyre carry moss to be spread upon their leys; and occasionally mix it with dung as a compost. Sir William showed me some hard poor ground on the tops of little hills, which had been laid over with moss, where the grass was as thick and verdant in the month of November, as any of the adjacent land, that had been dressed with marle.

The same proprietor has this and last year, burnt a great part of the moss that is above his marle; which is easily performed by kilns made of sod and flues cut out of the moss itself. When these kilns are fairly on fire, they are hardly extinguished by any rain, however heavy. Some brushwood or dry peat is necessary to kindle them at first, which is mixt with the moss, if it be wet, when laid on the kilns.

Peat ashes are well known to be a powerful top-dressing.

The

The most porous moss yields the least quantity of ashes ; but the expence of burning is trifling.

Mr Dundas of Blair, near Culrofs, carries off the moss, which has been floated down the Forth, and lays it in his straw-yard, to form a compost with the dung, by the treading of cattle. It is probable that the saline particles, which the moss had imbibed in its course, may increase its virtues.

On a little patch of ground in my own possession, there were laid about five years ago, upwards of one hundred and fifty carts of foul moss ; but before laying it on, it was made up, the preceding autumn, in the form of a dung-hill, having one cart of dung to every three carts of moss. It lay in this state till the next spring ; was finely pulverized and used with success. The same practice is followed in different parts of this country.

Upon light land, where there is a great proportion of sand or gravel, the moss naturally retains the rain and the dew, which that kind of soil could not naturally retain ; and by this supply of moisture, preserves such a dry soil from the effects of severe drought. After it is ploughed in, it not only acts as a sponge, but forms an addition to the staple of the land, no way to be disregarded.—The bounty of providence is wonderful, not only in this, but in many other cases. In every tract of this survey, and probably in most other places, where the soil is sandy and naturally parched, there are patches of moss and some swamps near at hand, to invite the industry of man, by laying them on these light lands, in order to render them more retentive of the dew of heaven. Shell marle is found for the most part in bogs and mosses, near such soil, to correct its quality.

Shell sand is discovered near Culrofs, which the farmers begin to use as a manure.

On

On the banks of the Devon, where that river frequently overflows the adjacent ground, the soil is composed of a heavy, moist fleech, which forms a very sluggish species of land. The crop lodged from year to year, before it arrived at maturity, which made it of little value. One of the farmers in this situation, laid a quantity of sand from the bed of the river, on such soil; and now it produces excellent crops of plump grain, which stands until it be cut down with the sickle.—Sand has been known to make a proper manure for moss, upon that general principle, formerly alluded to, that soils of opposite natures form invariably the best mixture, as correctives of each other. The inertness of one is corrected by the stimulating qualities of another; the coldness of one, which absorbs the rays of the sun, is corrected by the warmth of another, which retains them by reflection: and in the same manner with regard to other qualities.

The advantages to agriculture, by increasing the quantity of manure, ought to be carefully attended to by every man that occupies the soil. Many things are accounted of little value and allowed to go to waste, which might, by proper management, increase the produce of the earth. Some might be used separately, others formed into composts: foot, oil-cake, the scourings of ponds and ditches, urine of all kinds, night-soil, bones either broken down by a machine or dissolved in quick lime, ferns, thistles and other weeds cut down in their full sap, tanners rotten bark, the exuviae of all animals. These and many other substances, besides those recommended and treated of under this article would be found most useful in increasing the fertility of the earth.

Dung ought to be used, before it become too putrid, which renders it effete; neither ought it to be much exposed

fed

fed to the sun, to the washing of rain or to the blanching of wind, which never fail to diminish its virtues.

SECT. VI. *Weeding.*

IN almost every part of the county of Perth, the farmers weed their crop, when it is necessary. The lint is universally weeded, except the ground be so clean, that few weeds of any size make their appearance. In weeding their other crops, some of the farmers pick out thistles, docks and the larger weeds with a pair of wooden forceps already taken notice of, which are so long in the handle, that a man can work them standing upright. Others pull them with the hand: and others cut them over with a sickle in the right hand, and a forked stick in the left, to hold the weed firm against the teeth of the sickle. But the practice of weeding their corns is not so carefully observed among the moderns, as Columella tells us it was among the Romans. Where a regular rotation is introduced, where cleaning crops are sown and the land fallowed either with or without a crop, which is now becoming general, weeding is less necessary.

SECT. VII. *Watering or Flooding.*

THERE is no doubt that the primary causes of vegetation are heat and moisture. Egypt owes all its fertility to the overflowing of the Nile and a sun almost vertical. Every place, where this species of improvement is practised on suitable soil, is benefited by it, in proportion as that practice is extended.

From the remains of old channels, made for conveying water, it appears that the practice of watering land, in various parts of Strathearn and Strathallan, was more frequent
in

in former than in latter times. What has been said in the section relative to the flooding of meadows, will apply to the manner of conducting water towards any field, where it is to be introduced. But arable ground or waste land having generally a considerable declination, it will be often impracticable to flood them totally; the water must therefore be spread by means of small parallel or horizontal canals, which are made with a plough or spade, by turning the furrow down hill. The one will catch the water that escapes from the other; and by a little attention in not allowing too much to escape at any one place, the whole surface will be equally and constantly watered.

Water acts more as a stimulus than a manure, especially when the sediment is scanty: and by the ignorance of farmers in over-cropping their land, the soil is often reduced so much, that for some years thereafter it can neither carry grass nor corn. This circumstance has occasioned a prejudice against irrigation. Most men are very ingenious to throw the blame on something else, when they are in the fault themselves. The introduction of marle and lime has also contributed to bring water into disuse, without attending to this evident consequence, that these will have the same effect upon ground, which is kept in constant tillage.

An opinion prevails among many farmers in Strathearn, that water brought upon grass ground, which had been laid down some years before with lime, will deteriorate the soil in place of doing good. But this novel prejudice against water is without foundation; for one of the most skilful farmers in Monteath has often watered land, in that situation, with success; and a gentleman in Strathearn of approved knowledge in agriculture has often followed the same practice, after the land had been laid down with marle.

In every valley in the highland parts of the county, there is such command of water, and the operation so easy, that the extent of green ground and of the finest grass on the face of these hills, might be increased to an astonishing degree: and if the Board of Agriculture or the Highland Society of Scotland were to turn their attention to this subject, the benefit arising from it to the community would be rapidly and extensively felt. The views of both are highly laudable and meritorious, by running parallel, in promoting the good of their country: and it is the duty of every man, who is desirous to contribute his mite to the public prosperity, not only to wish them perseverance, which cannot fail to be successful, but to suggest such hints as may direct their efforts to the speediest and most effectual method of accomplishing the end they have in view. For my own part, I am convinced, from the most accurate observations and after the most mature reflection, that no mode of cultivation will sooner improve the higher grounds in the highlands, than the use of pounded limestone and watering the face of the hills: and with these, in most cases, it is very practicable. If limestone is not every where to be found, water is universal. If water cannot be made to remain or flow slowly upon the steepest declivities, the dust of limestone can be made to remain.

Notwithstanding that irrigation has gone much into disuse, it is still practised in various places; in the vallies and on the sides of the Seedlaw hills; on the side of the Grampians next the Stormont, in some parts of the forest of Isla, and elsewhere.

If the soil be light and dry, with a proper fall and command of water, there is no species of manure so cheap or so plentiful, which can contribute equally with water, to enrich

the land. When the tract for conveying the water has been once made with judgment, it may remain for centuries, requiring but very little repair occasionally, when it is to be used. Nature furnishes the manure, without any farther expence, and every fall of rain brings a fresh supply of the finest particles of earth, from the upper ground to increase the quantity and meliorate the soil below. Let the farmer look at every little valley in the front of his hills, where there is a spring, or where water descends, without cutting the surface, in rainy weather or during the time of a thaw, and from the quality of the grass in these, let him be convinced what a rich and beautiful carpet he might, by a little industry, spread along the sides of his heath-clad hills. If ever the sheepmasters of this county are brought to see, how much it is their interest to have plenty of food for their sheep, when they descend, on the approach of winter, from the higher and bleaker mountains, in quest of shelter and of nourishment, it is to be hoped, that instead of burning the heath, which is but a temporary expedient and a constant labour, they shall once for all, introduce water and destroy the heath, to rise no more. When the finer grasses decay, by the severity of winter, the coarser kinds, which grow in moist soils, will remain for a supply of food; and even the softer grasses, if not eaten bare, will shelter the ground and occasion a fine spring of early grass. Most kinds of grass, which have a blanched appearance in winter, and seem to be entirely decayed, acquire, at the root, a certain degree of verdure in spring, by means of a new circulation. This circumstance which is not generally understood, together with the cover it affords to the new tender grass, gives sheep a good bite early in the season, and has some effect in preventing

venting the laxative quality of food altogether consisting of grafs which is wholly new.

I have distributed many drawings of the level, for conducting water, recommended by Sir John Sinclair, where the ground appeared to be fufceptible of that improvement : and the attention of the gentlemen and of the generality of the tenants, to its construction and utility, gives hopes that it will be ufed.

CH A P. XIII.

LIVE STOCK.

NEXT to the cultivation of the ground and the introduction of the moft ufeul plants, the fpecies of live ftock, which is beft adapted to the foil and climate, ought to be the great object of a farmer's attention.

SECT. I. *Cattle.*

THE cows in general are of a bad breed ; not fo well haired and fhaped as the north Argyle-breed, nor giving fo much milk as the fouthern breeds. In feveral diftricts of the county, where farming is well underftood and plenty of clover and turnips is cultivated, the cows are fed in fummer on cut clover, without allowing them to depafture it. The fuperior advantages of this practice have been already taken notice of.

In the vicinity of Perth and bridge of Earn, the farmers are introducing the Angus and Fife-breeds. In the weft they prefer the Argylefhire breed, becaufe thefe cows are well fhaped, are hardy, have a fine pile, fatten foon, although they are not fuch good milkers as other breeds. In

some districts the Galloway cows or the breed from Airshire gets the preference, because they have much of the shape and pile of the Highland cows, and a greater quantity of milk. In Rannoch, Glenlyon, Glenlochay, Strathfillan and some other places, the Argyshire breed prevails. There is no particular district of the county, to which the Galloway cows are peculiar. They are however in great perfection at Lawers and elsewhere. The farmers in Monteth, who are desirous of improving the breed of their cattle, introduce cows from the Glasgow and Rutherglen markets, which are much the same with the Galloway cows. These are in great perfection in every gentleman's dairy of the district. We have cows occasionally from the markets at Stirling, which seem to have the same qualities and are probably of the same kind with the former.

Mr Graham of Balgowan has lately brought some cows and bulls, of different ages, from the county of Devon. The cows are said to excel in the quality of their milk, and their meat to have as fine a flavour, as any beef, the highland not excepted. They are handsomely shaped, only that their legs seem to be rather long; and are all of an uniform dark-bay colour, without a spot or pile of other hair, and their horns finely tapered. At Scoone, the earl of Mansfield had a dairy of beautiful cows of the Lancashire breed; not inferior to those at Balgowan in Shape, and superior in size. They were also nicely marked, which suits some people's taste, as a trait of beauty.—Almost all domesticated animals, whether quadrupeds or fowls, are variegated in the colour of their pile or plumage, while the wild tribes of the same species, are so perfectly uniform, that one individual can scarcely be distinguished from another.—We have the Guernsey breed of cows at Blair-drummond, whose
cream

cream is the richest I ever saw. A species from the East Indies are now at the castle of Lenrick in the parish of Kilrnadock, imported into Europe by Sir John Murray Baronet, which are thriving and promise to do well; but it is impossible and perhaps unnecessary to trace every variety.

Where the cows are large, consisting mostly of the breed from the counties of Forfar and Fife, which is the case in the Carse of Gowrie, they give from twelve to sixteen Scots pints of milk in a day, and they fatten generally to the weight of thirty or thirty-six stones. Some oxen, when fully fat, weigh one third more. The quantity of milk and the weight of beef varies almost in every province of the county, being in every instance influenced by the kind of cattle and the mode of feeding. In these provinces where rural economy is not properly attended to, the milch cows give no more than six pints, and the weight of a fat beast is no more than betwixt twenty and twenty-four stones.

The Highland Society deserve great praise for defraying out of their own pockets the expence of premiums which are annually given to those persons, who keep the best bulls in different districts, which will in time introduce a better breed of cattle into particular places; but while the benefit of that best bull or of the second best bull is confined to one farm, many years may elapse, before the amelioration of the breed can become general. Why might it not be made a condition in granting the premiums, that any farmer within a certain distance may have the privilege of having a breed of these premium'd bulls, if he chose to bring two or three of his best cows to be covered by them? There might also be premiums for the best stallions and for the best rams.

In some places of the Stormont, the farmers sell their turnips at the rate of five pounds or five pounds ten shillings
the

the acre to drovers from the north, together with the use of their cow-house and a little straw. These drovers bring in cattle of their own to consume the turnips and straw, which they fatten in this manner for the butcher. The dung belongs to the farmer. The general practice in the Carse of Gowrie is to purchase, in the months of September and October, such a number of young cattle at the markets in the neighbourhood, as with the other stock is judged necessary to consume the straw, before the following May; at which period the cattle are disposed of to the dealers or farmers in the adjacent counties, where they are fed for some months on grass, and afterwards disposed of in England or in the south of Scotland.

The more the soil is cultivated, and a better system of agriculture carried on, the more will the country be capable of supporting a larger breed of cattle, and the more desirous will the tenantry be to improve the present stock. In the moorland parts of the county, the attention of the farmer is mostly confined to his cattle, and in the districts best adapted for grain, the raising of the most valuable crop is the surest way of making the greatest returns. In some farms, which consist of an hundred acres or more of arable land, there are only a few cows to give milk to the family. In other places, farms of fifty or sixty acres, in tillage, have ten or twelve cows, and sometimes more.

In the midland parts of the county, where the soil is light and the produce of the dairy is an object of importance; where the pasture for cattle, by means of sown grass is abundant and rich, there is little doubt that a better breed of cattle, in respect of the quantity and quality of the milk, the weight of the carcase and the ease of fattening them, will become daily a matter of more attention. The farmers are
already

already very sensible of this advantage, and seem to be eager for a better breed

There is one circumstance, relative to the introduction of all new breeds, which must not be passed over in silence, because no farmer can neglect it without certain loss. Every kind of pasture is fitted to raise animals to a particular size. When beasts of a larger size are brought in, than the quality of the food is calculated to support, these animals, whether cows or horses or sheep or any other kind, will degenerate apace, and never prove useful, until they come down to that standard or size adapted to their situation and suited to their food. On the other hand, when a smaller breed than ordinary is brought in, they continue to increase in bulk, until they come up to the pitch, which is suited to their nourishment. But there is this remarkable difference betwixt these two progressions, in respect of profit, that in the retrograde progress, when animals are brought from rich pasture and a comfortable situation to the reverse, they are in every instance worse than the indigenous breed; whereas the animals, which are brought from worse to better, continue to improve, till they arrive at that perfection, which the change in their situation is calculated to produce. These causes may not immediately have their full effect; but in a few years they certainly and evidently shall. He makes, for this reason, a much safer experiment, who brings cattle from worse to better, than he who brings them from better to worse.—This reasoning applies to all plants as well as animals.—Highland cattle rise to a great size, not only by the keeping in South Britain, but in rich pastures at home.

In vain will you attempt to improve a breed of animals beyond the circumstances of the country as to climate and pasture; while at the same time, it is no easy matter to dis-

cern,

cern, without proper trials, how far these circumstances can support a better flock. Here is great room for the ingenious to exercise their judgment in improving the breeds of different animals. One species has evidently degenerated in this country, by a change in their situation to the worse. The red or forest-deer is but a puny animal in comparison of these of former times. This will be apparent to any person, who compares the horns of a deer that is killed at present to those of the same species, which are in different places dug out of the mosses. The cause is obvious.

The improvement of the soil ought therefore to go hand in hand with the introduction of a larger breed of cattle; and a large breed ought, for the same reason, to be introduced, in that degree, in which the style of agriculture is improved.

The most material objections, which farmers have against using oxen for the plough are that they are less expeditious in the dispatch of work, and that they poach the ground more than horses. The late Mr Mylne of Mylnfield in the Carse of Gowrie, who spoke from experience, was of opinion, that the poaching was much the same in both cases, and that oxen, when fed as well as horses, will do the same labour, and with equal dispatch. Mr MacLaggan, Lord Kinnaird's factor in the same district, still uses oxen, while the cultivation of his farm does not seem in my opinion to be behind his neighbours in any respect whatever.

SECT. II. *Sheep and Goats.*

GOATS are such hardy creatures and their milk is so nutritious, that at one period they were very much reared over all the Highlands of Scotland; but ever since the landed proprietors began to pay attention to their woods, as an article

ticle of profit, the goats have very much decreased in number, because they eat the succulent buds and otherways destroy woods by peeling off the bark; and since sheep-stocks have been found more profitable than goats, the latter have almost disappeared entirely in this part of the kingdom.

Sheep are the most profitable, the most useful and the most inoffensive of all browsing animals, known in this part of the world. Upon any given extent of pasture their returns are nearly one third more than that of any other stock. They supply us with food and cloathing, and employ a great number of manufacturers, from the shearman who cuts off the fleece, to the merchant who sells the cloth.

The ancient breed of sheep, in this country, were the white faced. They were few in number, compared to the flocks at present; and in the Highlands were housed in cots every night in winter and spring. About thirty years ago, the black-faced breed was introduced from the south, and bought in either in lambs or at a year old. Their numbers have increased beyond all expectation, since that time, over the whole Highlands of Scotland. In gentlemens inclosures, we see different kinds, according to their fancy, or the superior profit expected from one kind more than another. Mr Graham of Balgowan has on his parks, in the estate of Ledenock, a flock of Bakewell's and Culley's breed. Mr Haldane of Gleneagles has several kinds, both British and foreign. Mr Mylne had the Northumberland breed, when I was in the Carse of Gowrie; others the Leicester breed; and others had breeds different from all these.

In the glens there are great flocks; amounting in some instances to upwards of two thousand sheep. The increase of the numbers of sheep has been so rapid and so great, that persons, who attend not to the cause, are astonished

that black cattle have not totally disappeared or at least decreased, in the same proportion. The fact is, whatever be the cause, that our markets for cattle in the autumn and spring are as crowded as ever.

This problematical circumstance merits some consideration, and may probably be unravelled by attending to the present method of managing sheep-stocks. They get very little provender in the winter season; whereas by the old system, they were as regularly fed in the house, as the other animals, of which the farmer was possessed. The whole of his hay and straw is by the same means reserved for his cows and horses; which enables him to keep nearly as many in winter as before; and if some of his higher fields are in grass and his tillage less extensive, he has fewer work-horses to maintain; and the fields, which he ploughs, yield more abundant crops. He keeps also fewer hill-horses; a small species, of which at one time, there were vast herds in the highlands. His moors are better preserved, and his stock more adequate to the size of his farm.

These are not the only causes: the people in the highlands have been stocking their farms with sheep, these thirty years or more. This rage for a sheep stock is still going on: and the cattle must necessarily travel down to market, whose place is annually occupied by sheep. If we suppose sixty or one hundred farms to be every year changed to the sheep system; the cattle from these will help to support the numbers at market. This propensity to stock with sheep must be gratified; but when fully gratified, it must have an end: for beef must be had at any price; and when the time comes, that the tables are to be turned against the sheep system, in favour of black cattle; they who discern the approaching change

change and are prepared for it by breeding cows, will reap the fruits of their discernment.

In accounting for the numbers of black cattle at present brought to sale, we ought by no means to forget the improvement occasioned by the sheep themselves. They enrich the quality and enlarge the quantity of grass within their walk, more than any other species of animals. They never deteriorate the soil; they render it always more and more productive: and wherever their numbers are increased upon a certain extent of land, they help to support the increase of their own numbers, by producing an increase of food. The ground is not only made green, and the heath extirpated, by the enriching quality of their manure, but the finest grasses spring up spontaneously, where it had formerly been scanty and coarse: and when this powerful top-dressing of our whole hills with sheep dung and urine has been completed, there is little doubt that, in a few generations, the Grampians will be as verdant as the Ochills, and that the Ochills had once as forbidding an aspect as the Grampians.

Twenty-seven parishes of this county may be considered as in a great measure occupied by a sheep stock, besides the flocks on the Seedlaw hills, which stretch eastward from the hill of Kinnoul to the confines of Angus-shire. Five of these parishes belong to the Ochills, the rest are adjacent to the Grampians or within their bosom. By a computation of Mr Haldane of Gleneagles, who had paid particular attention to this subject, there are 50,000 sheep in the whole Ochills. Three fifths of the Ochills are in the county of Perth; which may be estimated at 30,000 sheep, or 6,000 to a parish at an average. But many of the parishes belonging to the Grampians are by far more extensive than

those of the Ochills, (some of them as extensive as the whole Ochills together,) we may therefore compute each of them at the average of 8,000, which will amount to 176,000. It gives me pain that I have omitted to take down, in my notes, some criterion, by which a calculation might be made of the sheep on that part of the Seedlaw hills in this county. Let them be supposed 16,000, and if I am in a mistake, the candid at least will forgive a mistake, that is involuntary. The whole sheep in Perthshire may in round numbers be calculated to amount to 222,000.—Although it would be unpardonable to pass over a subject in silence, which includes so much of the floating property of the county, yet a full investigation of it is left, without reluctance, in better hands—in those of the Society for the improvement of British wool.

Mr Haldane says that the sheep-masters in the Ochills rear more of their own lambs than formerly. They keep no other grafs for their flocks in winter, but the scanty Gleanings, which remain of their summer pasture; by which means many of their sheep perish in severe seasons. They have the practice of smearing their sheep. Since the breeding became general, the sale of full grown mutton is necessarily less. Good wedders, eating their fifth grafs, sold in the year 1793 at eighteen shillings and weighed from fifty to sixty pounds the carcase. The increasing demand has induced the farmers to keep fewer cows and horses and more sheep. The wool sells from ten shillings to twelve shillings and six pence, and the smeared wool from five shillings to six shillings, the stone of sixteen pound weight. The sheep are generally washed in some clear stream or pool, before they are shorn. The same gentleman adds, that he has within these few years, brought to that place sixteen of the
finest

finest rams, Spanish, Cheviot, South-down, Ryland and other breeds, whose wool sells at twenty shillings, instead of ten, the current price of the wool from the common breed : and although he has had ten score of country ewes covered gratis by them, in order to meliorate the breed, yet a fear, lest they should not thrive in that climate and management, deters the store-masters from making a fair trial. See his Memorial, Appendix, N^o 5.

While so much of the yearly income of the gentlemen of this county depends on sheep, every thing ought to be done, that is possible, to render them a stock, still more valuable. We have as good reason for improving the present breed, as our countrymen some years ago had for improving the breed, which was in the country at that period ; and as their views carried them no farther than to increase the carcase, why may not we try to increase the quality of the wool ?

This object can only be attained, either by *changing* the present breed entirely or by *improving* it : And as it may be improved by introducing rams, whose wool is finer, while their size is equal to the sheep we have ; this seems to be the safest and the cheapest experiment ; and there can be no objection, but one, against its success.

If the rams are from a warmer climate, there is a danger, lest they may not agree with ours : for man alone, of all the creatures that inhabit this globe, can endure every diversity of climate, and has a constitution that can accommodate itself to every latitude, where animal life can exist. Every other species has a climate peculiar to themselves.

The nearer the temperature of that climate, from which the rams are brought, is to that of this country, the higher is the probability of their succeeding. The climate of Spain is so warm, that the constitution of Spanish
sheep

sheep may not, for a tract of years, be naturalized to the climate of Scotland: nor have we yet arrived at the attention bestowed on the royal flocks of Spain, having one residence and one climate for sheep in summer and another in winter, and clean grafs at both seasons. We surely might have, and ought to have, changes of grafs; and we might improve the climate, by means which are also in our power.*

A question has been started, whether the qualities of sheep, depend on the breed or the pasture or the climate.

Without entering formally into the discussion of this point, what seems to be nearest the truth is, that the qualities of animals are affected by all these causes; by some of them more than by others; and that some of these are effects of one another. There is no doubt that in ordinary cases, fine grafs makes the fattest sheep; coarse grafs the hardiest, and dry pasture the finest woolled: and there is as little doubt that the climate and other local circumstances determines the quality of the pasture. In all situations your success is greater, when you second nature, than when you violate her laws.

Tu nihil invitâ dices *faciesve* Minervâ. HOR.

A breed, that makes the least change from the circumstances, in which it had been formerly placed, has a far better chance of thriving, than a breed, which makes a great
or

* As it may be doubted by many readers, whether the climate can be improved, it would have been proper here to explain by what means. *Anonymous.*

Ans. Although I do not think myself bound to answer the remarks or questions of an anonymous writer; yet it is mentioned in this same article, that planting improves the climate, and that besides the shelter of plantations, cots or shades might be erected for the protection of sheep in stormy weather.

or violent change. If these circumstances are attended to, if the necessities of the animal are supplied, if his warmth and his food be nearly the same as before, his constitution will soon be accommodated to his new residence. But if you do nothing for him, to make him as comfortable as he was formerly, depend upon it, he will not thrive. Meliorate your accommodation, and nature will mould the constitution of the animal to your wish.

There is one part of the economy of nature, in favour of introducing into this country, a finer-woolled breed of sheep.—All animals in a cold climate are clothed with a finer fur than those nearer the equator. Wool is the fur of this species; and we are not at liberty to suppose, that nature intended sheep to be an exception from that general law. A few trials may perhaps fail, owing to a variety of accidents, but perseverance must finally succeed. The change ought however to be gradual. It ought not to be extreme; it ought to be cautiously gone into, by crossing the indigenous breed with other rams; and above all it ought to be made, after providing for the sheep introduced, the conveniencies, as nearly as possible, which they had in their native country. This provision depends very much, on rendering the country warmer in winter, by planting the wastes in sheep walks, and by supplying them with winter food, which they may eat comfortably and plentifully, under the covert of that shelter.

In the report of Strathearn and Monteath sent to the Board in 1793, there was a full statement of three actual sheep farms, given to me by persons of veracity, from their own knowledge, ascertaining the profit upon each, and showing the comparative gain of a *breeding* stock, which consists

fists of ewes and lambs, of a *wedder* stock in a stormy situation, and of *ewes seven years old* in a gentleman's parks, which are changed every year. See CHAP. IV. SECT. VI.

Sheep are delicate animals, subject to a variety of diseases and other casualties. In wet soils, some are carried off by the *rot*, which is a consumption attended with a dropsy, and hitherto incurable. Others are attacked by the external *hydrocephalus*, which is a collection of water in the head betwixt the dura and the pia mater, and in these creatures always accompanied with a vertigo. They are also afflicted with a *trembling* or weakness in their limbs, for which there has hitherto been no cure. A gentleman, who is conversant in the diseases of beasts, told me, that a little warm milk with some Jesuit bark would cure the trembling. In other cases they are seized with *blindness*, which some persons cure by opening the vein below the canthus or inner angle of the eye, called the angular vein, then by holding the creature's head in an inverted position, to make some drops of the blood fall into the eye, which operate two ways in effecting a cure of the ophthalmia; first by moderating the increased action of the vessels of that part, which is the proximate cause of the inflammation; and secondly the blood, being admitted into the eye of the animal, will act, by reason of its mildness and its warmth, as an emollient, which also contributes towards a cure. After this operation, the white specks on the eye are removed and the sight completely restored. Others pound a little glass, that is blown into the eye with a quill open at both ends, which by its friction wears off these specks or scales.

But the *braxy*, as it is called, which seems to be of the nature of a *gastritis* is not only the most fatal of all the diseases

saes of sheep, but has hitherto baffled all the skill and art of man*.

Some farms are more liable to this disease in sheep than others; and it was altogether unknown in the Highlands, until they began to introduce a new breed and to leave their sheep, at all seasons, in the fields. A change of grass, especially to clean grass, or clover foggage, in the latter end of autumn, has often been tried successfully. The only remedy indeed seems to be to try to prevent a disease, which after infection, has in all instances, been found hitherto incurable. The first and great point is to investigate the cause of any disorder, incident to man or beast; without which it is impossible to make any application with a prospect of success.

The braxy is most fatal within the region of the hoar frost; while it makes less havock and is scarcely felt, in situations which are more elevated and more remote from the tracts of rivers, marshes, or large bodies of fresh water. As an antidote against this distemper, the sheep are sometimes chased with dogs, and not allowed to remain long at once, without being disturbed, at the season in which danger is apprehended; for whenever a sheep stops, after having been annoyed, he passes water; and as the bladder is generally burst of such sheep as die of the braxy, a part at least of the complaint may be a stoppage in the urinary passage.

It is well known, that sheep drink very little, that they are very fond of salt, which is an antiseptic, and that they are of a dry constitution; all which may be a part of the economy of nature, with respect to these creatures. When

S s

they

* Good keeping in the autumn is a most certain preventative. *Mr. Bailey of Chillingham.* *Ans.* That is recommended in this article, but it is not always effectual. Nay the fattest are most frequently cut off by the braxy.

they are forced therefore to eat the hoar frost, which is only water in a congealed state, such a chillness may be produced by this frost, and such a quantity of water may be suddenly lodged in the stomach, as may occasion a suspension of the *excretories*, particularly the urinary ones, in so much that the quantity of liquid may prove fatal; especially when the sphincter of the bladder is so contracted and acquires such a rigidity by the cold, as not to be capable of the necessary relaxation.

The hoar frost of winter is nothing else but the dew of summer. The dew is mostly the ascending exhalations at sunset, and partly the perspiration of plants, after the sun is gone down. These exhalations, in the beginning of winter, when the influence of the sun is weak, are condensed into drawling clouds of white fog, which sail along the valleys in the evenings; and during the succeeding night, this drizzling vapour of congealed dew falls by its own gravity to the earth, and composes the powdering particles, which we see on the grass and trees. Their want of fluidity prevents them from running together into one mass, and preserves on the grass the very shape and size in which they fell; whereas the fluid particles of the summer's dew easily unite, after coming into contact, and constitute, by their fluidity such globules, as their mutual attraction is able to produce.

It is a fact that lambs are more frequently attacked by this distemper, than full grown sheep: and as this subject is of much importance, it may be of use to inquire into the cause. They feed on the same pasture, have the same care of the shepherd, sustain the same vicissitudes of weather and have every other thing in common with the rest of the flock. The delicacy of lambs, or the inferiority of their strength cannot account for this matter. Inferiority of strength does

not

not always imply inferiority of constitution; for the young of many species of animals are able to endure as great hardships, and sometimes greater, than their dams. May we not venture to suppose that the instinct of animals is, in some cases, assisted by experience: and that, without habit and experience, as a variety of facts show, it is not in every instance, the infallible guide which we imagine it to be. Lambs, which never saw hoar frost in their lives, before the beginning of their first winter, have no experience of its effects upon their health; nor has their constitution acquired that tone, which might make it in some degree harmless. We see cows, in the same manner, which are not accustomed to browse among wood, whenever they are brought to a woodland farm, or feed on certain grasses, of which they had not been accustomed to eat, become often diseased and sometimes killed; while the cows, in the same herd, which have been accustomed to this food, suffer no inconvenience. Cows, accustomed to red clover, are seldom hurt by it, which is surely a lesson of experience or the effect of habit: And notwithstanding the virulent poison to cattle, in yew leaves, (which are said to be fatal, only when cut off and found lying on the ground), perhaps it might be possible to bring cattle, by custom, to eat them in a certain degree, without danger. I have the best authority for saying that an island in Loch-lomond, where yew-trees abound, is frequently depastured with safety by cows. Have not some of our most sovereign drugs, some ingredients in them that are poisonous? And is not the human constitution by being accustomed to opium and other vegetable and mineral substances, brought to take them, not only with safety, but with benefit, in such quantities, as without the aid of habit, would occasion immediate death.

In bleak and stormy situations, where there is alternate frost and thaw, in quick succession; where the bottom is wet, and the exhalations plentiful which constitute the hoar frost; where the pasture is poor and scanty, being only the rejected gleanings of the summer food; and where the natural state of the ground affords no shelter, *there* ought shelter to be provided by the industry of man, either by erecting shades or cots for the sheep, or by making plantations in convenient places, to which they may resort in the hour of danger, when we see them descend from the mountains, previous to a storm: and if clean grass were saved, or other food provided for them, many of their diseases would be prevented; and by more ample returns they would fully repay the whole expence. Let it never be forgotten on this subject, that the *braxy* was *unknown*, and other diseases less frequent, in the Highlands of Scotland, while the sheep continued to be in cots over-night, during the season in which they now perish. It seems therefore not improbable, that until we substitute something in place of these; our sheep shall be liable to their present casualties. It is also probable, that the superior quality of the ancient Scottish wool, which is so much celebrated, and of whose fineness there are such ample proofs, was in a great measure owing, not perhaps to the breed, at its first introduction, but to the warmth occasioned by these cots: and it is also probable that by using the necessary precautions, a new breed, or at least another crossing the breed we have, may be managed so as to thrive and do well.

This subject shall be concluded, by some remarks on the management of sheep stocks in the Grampians, to which this survey refers. The manner in which they are treated in the Ochills, has been taken notice of already. In the
more

more inland parts of the county, the ewes are allowed to remain for the most part in the low pastures in the vallies, where they have plenty of shelter and food, until the lambs are taken off, towards the latter end of July. At this time they are removed to the mountains, and the low grounds are saved for winter food. About the beginning of October, the store-masters smear their lambs; and if the weather be favourable, they continue the work, without intermission, till all the sheep they intend, be smeared. In some places they smear only the weaker sheep; in other places the whole. The composition now in use is tar and butter. Some take ten Scots pints of tar to a stone of butter; others only five pints of tar to that weight; and others in the various proportions between these extremes. This quantity sufficeth for laying fifty five or sixty sheep, at the rate of three or fourpence each, according as there is more or less tar in the mixture. Formerly shepherds used tobacco-juice and soap, and in some cases chamber-ley; but these are laid aside as less efficacious. One man smears twenty or twenty four in a day, leaving about an inch betwixt every shed of the wool.

The benefit expected from this practice is that it makes the sheep hardier and warmer, that it cleans them from vermin and cutaneous distempers, and that it prevents their losing the wool. They contend farther, that the wool pays very nearly the whole expence, the same number of fleeces of smeared and white wool bringing an equal sum in the market, because what the smeared wool wants in quality, it has in weight; and lastly it is urged, that the more butter there is in the composition, the grain of the wool is the softer and more silky; that by the practice of smearing, the
young

young sheep are raised in the bone, are preferred in the market and fetch a better price.

Notwithstanding all these arguments in favour of smearing, others condemn the practice totally. There is little doubt that it forms a crust about the animal's body and contributes to defend it from the cold; and thus may be proper in a stormy situation, while it is unnecessary where there is plenty of shelter.

Lambs sold in the 1793 at four or five shillings; in the 1796 their price rose two shillings a head. Wedders two years old were then bought for ten shillings and six pence, these of three years for fourteen shillings; in the space of three years, they cost about three shillings more to the buyer. Butcher meat of all kinds has risen in the same proportion, being between twenty and twenty-five per cent higher in 1796 than it was three years before: so fluctuating are the prices of almost every commodity, especially of the articles of life, and so easily affected by a variety of circumstances which are often unforeseen. A war always occasions a rise in the price of meat: for although the same or perhaps a greater number of people are to be maintained in the time of peace; yet their food is not of the same kind; which creates a difference immensely great, and always in proportion to the number of men removed from their common diet, to the manner of living in the army and navy. Plans are proposed for bringing down the prices in the London market and elsewhere. There may be forestalling and jobbing, but these are only partial causes and can only have a temporary effect. While the great cause exists, the necessary effect must be felt, not locally but universally.

The grass-meal of a sheep, as the lands are now let, is valued at two or three shillings. It is a general rule in letting

ting lands for sheep walks, to estimate the rent by the value of the probable number of lambs, according to the prices at the time; by which estimation the shepherd has the wool for his trouble, besides the difference betwixt the value of the old sheep he sells off, and the lambs which he adds annually to his stock.

When snow is falling or blown by a storm, the shepherds drive their flocks, without intermission, round the top of a hill in a circle, to keep them from lowring and being smothered. The practice in some countries is to erect circular folds on the tops of low hills for this purpose. When the heath has been all covered, they sometimes harrow the snow, to bring up the heath; in which case, the harrows ought to have long teeth and these few in number. Others throw hay or unthrashed corn in handfuls upon the snow to feed them: But after all, a provision, suited to the various necessities of these useful animals in the winter season, and adapted to the climate of north Britain is still very much wanting.

Mr Marshall says on this subject, "that cultivating plots of furze, broom, juniper, &c. by sod burning and rippling the surface, or by other more eligible means, could not fail of proving beneficial upon the wintering grounds of a sheep-farm. By means of those as a resource in the deepest snow, when the herbage of the braes were buried too deep and too evenly, to be uncovered by the scraping of the sheep; by keeping the most exposed parts of the braes in full herbage, for less general coverings of snow; and by reserves of rape, for the season of lambing; even ewe-lacks might be supported through the winter with some degree of certainty, without dry fodder; and without being left to the uncertainty

tainty of the seasons, and the mercy of the winds and weather, as they are at present."

SECT. III. *Horses.*

IN a tract of country so widely extended as the county of Perth, where the surface is so much diversified, the qualities and situation of the soil so different, and the circumstances, habits and opinions of the inhabitants so discordant, the breed of their horses, and indeed of all their live stock, may be expected in different districts to be unsimilar to one another. The only point almost of resemblance between the highland and lowland horse is, that they are of the same species.

Mr Marshall says, "that the true highland horse is somewhat below the middle stature, about twelve or thirteen hands high; the back generally hollow and the sides flat, but mostly wide at the buttocks; the chest deep, the bosom wide and the legs generally good; the prevailing colour grey, changing early to a white. The highland horses travel with safety and perseverance; and for the highland roads, whether they lead over rugged or rotten surfaces, a better breed it would, perhaps, be difficult to introduce; but they are light for two horse ploughs. This added to the great objection which modern sheep-farmers have to horses on the hills (where great numbers of them were formerly bred) has checked the breeding of this useful species of horse."

"Horses have ever been the beasts of draught in the highland districts; where oxen have never been worked, in the ordinary practice of farmers. Formerly, four horses a-breast was the plough team of the highlands, and is still in use; though nearly superseded by that of two horses with reins. Hence the propriety of having introduced the lowland breed

of

of horses or a cross between these and the old breed. The modern plough team has been in use in Breadalbane and some other provinces, for the space of twelve or fifteen years."

In the Carse of Gowrie and other lowland districts oxen were employed to draw the plough, till about twenty years ago; and the horses were only employed to harrow in the seed, to carry out the dung and bring home the corns to the stack-yard. In the section relative to cattle notice has been taken of the objections, which modern farmers make to employing oxen in the plough as formerly. Mr Donaldson says "that when oxen were discharged from the plough, it became necessary to purchase larger horses than were then bred in the country; and the markets of Glasgow, Falkirk, Stirling and Perth were resorted to for that purpose; which practice still continues, though not to so great an extent as formerly; the very high price of horses having induced the farmers to rear their own stock: and they appear so sensible of the advantages of this mode of management, that there is little doubt of its becoming general. A pair of plough horses, which ten years ago could have been purchased for thirty pounds, would in the year 1794 cost fifty."

Any thing known to me about the treatment or diseases of horses, besides what is generally known, is very immaterial; but there is subjoined in the Appendix, N^o 8. a Letter from Mr James Wright, Farrier in Crieff, on the subject of Glanders in horses, to which the reader is referred.

SECT. IV. *Hogs.*

MORE swine are reared in Athol, Strathardle, Glenisla and Glenshee, than in all the other districts of the county taken together. In these places the farmers rear huts for their swine in convenient parts of their moors, during the season

that the corns are on the ground : and besides their own consumpt they bring down herds of thousands at a time, to be disposed of in the fall, at the markets of Kinrossie and Coupar. The farmers, the millers and the distillers for many miles, between Glamis and Perth, and between Dunkeld and the Seedlaw hills, supply themselves at these markets. From the same quarter, Strathbawn, Glenalmond, Glenqueich, Strathtay, Breadalbane and many other districts are provided with hogs to be fattened for pork and bacon, beyond what they rear for themselves. The breed which is most frequent in these hilly countries, as being the most hardy, is what is called the Scots sow ; having long bristles, a long snout, long legs, the belly less pendulous, the back raised and the ears less flouching than in the other breeds : but notwithstanding their uncouth appearance, they fatten well, and are fitted for an exposed situation by sustaining more hardships than any other kind of hog known in this country. Where swine are reared in the low country, the Chinese breed is either crossed with the Scotch, or preserved pure. In some places, there is a larger breed than either of these, which Mr Dalgearns at Meigle told me weighed twenty stones. The distillers over all the county rear and fatten swine, which are bought up at all ages by the inhabitants in their neighbourhood.

Not many years ago, the Highlanders in general had a disgust at this kind of food, without being able to give any reason for it ; but their dislike to pork has greatly worn off ; in so much that in a short time this loathing at swine's flesh will be accounted a singularity even among the Highlanders.

Mr Donaldson reports " that in the Carse of Gowrie there are about two thousand swine reared annually. They are principally fed on clover in summer, in winter on potatoes and

and what corn they can pick up in the straw-yard. Pork and bacon constitute a greater proportion of the food of the poorer inhabitants in that district, than in any other part of Scotland; and there is scarcely a manufacturer, tradesman or labourer, who does not feed one or two pigs every year for the use of his family. The remainder meets a ready sale in the markets of Perth and Dundee. Young pigs sell for five or six shillings, at six weeks old; and pork at four shillings, or four shillings and six pence the Dutch stone." The prices are nearly the same over all the county of Perth.

SECT. V. *Rabbits.*

THE Duke of Athol has a warren between Dowally and Dunkeld, to which he pays some attention. It seems to be well stocked, for I saw them frisking about in great numbers in the autumn of 1795, on a fine bank, where the soil was sandy, along the east side of the Tay. There are rabbits at Marly, Mr Farquharson of Invercauld's seat in the Stormont, and at Glendoig in the Carse of Gowrie. Lord Methven has a warren on his estate, near Perth. There are also wild rabbits in the vicinity of Callander and in various other parts of the county; but the soil is in general unfit for them, as we have no downs;

SECT. VI. *Deer and Roes.*

THE red-deer, one of the species of the *Cervus*, is not so numerous in this county as formerly, yet we have such remains of them as to deserve being mentioned. The principal forest of Perthshire is in Athol, in the heart of the Grampians, and on the confines of the shires of Inverness and Aberdeen. The Duke allots many thousands of acres to his deer, is a great sportsman himself, and often resides

in the forest for several days. This forest was famous even in ancient times, when they were so frequent, that every chieftian had a forest of his own. In the year 1530, James the fifth, Margaret the queen mother and the Pope's ambassador, together with their attendants, had a temporary palace of wood erected for them by the Earl of Athol, on the north side of Benglo, at a place called Lochainn, distant twenty miles from the inhabited country, in the recesses of this forest, where they remained three days. Lord Perth has deer in his forest of Glenertnay. The forest of Mamlorn has been converted into a sheep-walk, about twenty years ago. There had been a forest in Benmore, Glenfinlafs and Benvenue; all in the county of Perth.

While the deer were permitted to inhabit the vallies, and and the country was under wood, the natives hunted them, by surrounding them with men, or by making large inclosures of such a height as the deer could not overleap, fenced with stakes and entwined with brush wood. Vast multitudes of men were collected on hunting days, who forming a ring around the deer, drove them into these inclosures, which were open on one side. From some eminence, which overlooked the inclosure, the principal personages and others, who did not choose to engage in the chase, were spectators of the whole diversion. These inclosures were called in the language of the country *elerig* which is derived from another word that signifies *contest* or strife. One of the farms in Glenlochay of Breadalbane is called *Cragan an elerig*, a small rock which overhangs a beautiful field resembling the arena of an amphitheatre, probably the first that was cleared of wood in that district, and admirably adapted for this purpose, by the natural situation of the adjacent ground. There are *elerigs* in various parts of the county.

The

The stag or male deer sheds his horns in spring either earlier or later, in proportion to his age; the oldest always first. About Lammas their horns are fully grown, which are solid, cylindrical and ramified, with sharp brow antlers. During their growth, they have extreme sensibility, which decreases as they advance to their full length. The hinds have no horns. The horns of the fawns begin to appear, when they are about six months old. In the rutting season, from the middle of September to the end of October, the stags are wildly furious, despising danger and ready to attack every creature that annoys them.

The roe-buck and doe are in many parts of the county, almost in every district, which is not divested of wood; and although no sanctuary is allotted them, like the deer, they live nearer to the habitations of men; but always in the neighbourhood of extensive and solitary woods, to which they may flee in the hour of danger. The deer are gregarious animals, and associate in herds, one being always appointed to keep watch, while the rest are asleep. The roes travel in single families, seldom more than four together, the sire, the dam and two kids. At the rutting season, which is about a month later than with the deer, the kids are driven off in quest of a new settlement and a new connection; the old pair continue constant in their affection from year to year, unlike the faithless hart, which bellows mad with promiscuous love. The buck's horns are like the hart's, solid, cylindrical and shaded annually, but much smaller in size, and having two points at the top. The sagacity with which the females of both kinds hide their young can only be equalled by that, with which the young keep close to their form, until the dam return to raise them.

The

The moose deer, it is probable, once existed in Scotland, but the species is now extinct. This probability is founded on the large horns found in mosses and marle pits; which far exceed any horns now carried by the stags of this country: Yet the argument drawn from the superior size of horns is not conclusive. The deer, like other cattle, rise in the bone by good keeping; and the breed degenerates when the pasture is poor. How different is the lowland cow from one reared in the mountains. When the deer enjoyed the extensive range of the most fertile vallies, and were fed undisturbed, by the most luxuriant grafs, they must have been larger, both horn and hoof, than at present, while banished to the recesses of the highest mountains, and compelled to live on such coarse fare, as they can find on the mountain's brow. The horns of the moose deer are palmated, like those of the fallow deer, only larger; which is a surer characteristic of the species, than the size alone.

The only fallow-deer in the whole county are at Blair Athol and Taymouth. Although the fashion, and nothing but the fashion, has allotted this species of cattle to the most wealthy of the nobility alone, yet other proprietors in Perthshire might be pointed out, whose fortune entitles them to have a park of fallow-deer. Nor do I know any species of tame animals, that are more elegant in their appearance, if they be well selected, or better suited for occupying an extensive lawn, which stretches round the castle of a great man.

SECT. VII. *Poultry.*

GEESE, turkeys and ducks are reared in great numbers and in great perfection in almost every district of Perthshire. You see fine flocks about the houses of gentlemen and the
higher

higher class of farmers. The late Mrs Robertson of Ardblair had the greatest show of turkies I saw in the Stormont. The common dung-hill fowls are at every door from the hen-house of the lord of the manor down to the meanest cottage. The utility, the method of rearing, the nutritious quality and delicacy of the food, which poultry affords, are so well understood, that it is unnecessary to give a detail of either.

In many places a certain number of common fowls is paid to the landlord as a part of his rent; upon large estates in the Highlands and in the best cultivated parts of the low country, this practice is abolished; and in general, it is going into disuetude over all the county.

SECT. VIII. *Pigeons.*

IN the Highlands dove-cots are rare, but in the lower parts of Monteath, of Strathearn, in the Carle of Gowrie, about Coupar and Perth, many pigeon-houses are to be seen. When set down with taste, and in a proper situation in a gentleman's pleasure ground, they form fine vistas from particular points of view, in his park or from his dwelling house. Contiguity with the other houses, in the situation of a dove-cot, ought to be no object. They travel far for their food, and can find out the barn-door, although it be distant from their home.

The manure of pigeons is well known to be very powerful, and their flesh highly esteemed as very palatable: but the farmers universally complain of the devastations committed on the growing corn, every where around them, not only by what they eat, but by what they tread down. Their usefulness is thereby lessened so much, that they are prejudicial to the country at large; and as a grievance
both

both to neighbouring proprietors and to the tenantry on the estates to which they belong, it is to be hoped, that every legal measure will be employed to restrict their numbers.

An abuse of the law, which authorizes certain proprietors to erect dove-cots, has met with a seasonable check, by a late decision of the court of session, in an action relative to a dove-cot on the estate of Carberry-hill; and the east Lothian farmers deserve great credit for the spirit manifested in this instance, in defending their property and privileges against the misapplication of a law, which in its best acceptation is a hard statute.

Let any person make an experiment to ascertain the voracity of these creatures, and he will find that in two or three days a pigeon will consume grain equal to its own value. What havoc must this rapacious animal make in months and years? When the poor are at times pinched with hunger, when all ranks in the state do occasionally, as in the season 1796, retrench their expence in bread, it is a serious reflection, that grain, equal to the maintainance of 3,000 persons is, according to calculation, devoured by pigeons in the county of Mid Lothian alone*. What an enormous misapplication of the food of man in all the eighty five counties of Great Britain! Upon the supposition that some counties may have fewer pigeons than Mid Lothian, others may have more; yet allowing the one half at an average to every county in the island the consumpt of pigeons is equal to the food of 120,000 of the human species.

SECT. IX. *Bees.*

IN the sheltered parts of the hilly country, bees are an object of great attention and profit.—The saccharine juice

ON

* See Survey of Mid Lothian.

on the flowers of heath produces honey of an amber colour, of the sweetest flavour and of the richest taste. It is not uncommon to see twenty four hives in one garden, north of the Stormont, towards the east end of this county. In Athol, in the west end of Strathearn, on the south side of the Ochills, and along the courses of the Teath and Forth from the still water almost to their sources, bees are industriously propagated and their honey makes a considerable article of commerce.

It is well known that the greater part of flowers emit the substance of which bees are so fond, and that the farina is kneaded by them into wax for their cells.

The leaves of many trees, especially the plane and the oak are richly laden with honey-dew, which is now plainly understood, not to fall from the skies, as has been generally supposed, but to issue from the pores of the leaves themselves: and seeing that this liquid is invariably found on the upper side of every leaf, it is probably extracted in the course of circulation, by the influence of the sun. Betwixt the inner rind and the body of every tree, there is a juice, during the season in which it grows; which juice is more or less sweet according to the nature of different plants, and in the course of its circulation, extending to the branches and to the leaves, constitutes the honey-dew.

The economy, the government, the propagation, the amazing instinct of bees, and the virtues of honey as a pectoral, being foreign to my plan, it is not my province to describe. I must reluctantly check any propensity of launching into the flowery regions of natural history, however delightful to myself or pleasant to the reader. My business is to detail matters of fact in order to direct farmers in making

U u

experiments

experiments and in following the example of the most intelligent improvers.

Honey was long esteemed as a medicine and performed many extraordinary cures; although it has been of late banished by the faculty from their dispensatory.

Attentive bee-masters can give their honey almost any flavour and any colour, from a bright amber to a pale yellow, by the selection of the food of their bees. Mr Paterfon of Castle Huntly sows Minionette for his bees, which gives the honey a most delicate flavour. Rosemary does the same. The honey of beans is pale; the honey of heath brown. Their flavour is also different.

How valuable this little insect, which consumes not one handful of human food in a whole county, while it labours incessantly to promote our health by its honey, and our cheerfulness by its wax! How wisely ordained, to prepare for us, what we could not have gathered or prepared for ourselves! How different in its utility from these creatures of the feathered and creeping tribes, such as pigeons and dogs, which prevent the increase of population by consuming the food of thousands.

CHAP. XIV.

RURAL ECONOMY.

IN the rural economy of this county, the Highland provinces did, time immemorial, follow a practice, which was not peculiar to them alone; but in the pastoral state of all countries and during one period of their history, was universal among all nations on the face of the earth. When the whole property of the husbandman consisted in cattle: they necessarily

necessarily occupied all his care. In winter he chose the most comfortable spot of his possession for his own residence and that of his stock; but in the summer months he emigrated from place to place with his flocks and herds, traversing alternately, in quest of new grafs, every station, where he had a right of pasturage.

The small patches of arable ground were soon ploughed, according to the rude husbandry formerly practised in the Highlands of Scotland; and the labours of the spring were soon finished. From that season until the approach of harvest, the *winter-toun*, as it was called, was only visited occasionally by the men to collect fuel, to weed and take care of the crop; while the women, the children and the shepherds resided constantly for three or four months behind the mountains, in the remoter vallies, and changed their residence more or less frequently, according to the extent of hill-grafs annexed to the respective farms. The women spun wool to clothe their families against the approach of winter, and manufactured their milk into butter and cheese. A trusty shepherd was always sent before, to preserve the grafs; that the cattle might have a full bite upon their arrival; and the husbandmen regularly repaired the huts a few days before the emigration took place to a new settlement.

This was the season of festivity and of plenty to man and beast. The amusements, the food, the innocence, the unaffected simplicity of manners peculiar to the pastoral life, have furnished the ancient poets with the ideas of the golden age. Fishing and hunting were the favourite sports of the more athletic; and all the toils of the day were soon drowned in the sweetest slumbers, invited by the fragrance of a bed of heath. I have seen in these temporary settle-

ments, groups of children, frisking about in a single frock of home made flannel, well fed on the produce of the dairy, with health and manliness in every countenance. Their juvenile diversions and their games were of a martial nature; and their little skirmishes had a tendency to form the heart to heroic courage and to inspire the soul with ardor for the more serious exploits of a field of battle.

These were the nurseries of the intrepid levies which never turned their backs to the enemies of their country in the hour of danger. These repelled the most formidable invasions, spurned at a foreign yoke, and preserved to Caledonia, the *envied distinction* of never having been conquered. These would never bow the neck even to the haughty Romans, who laid all the rest of Britain in chains.

The green ground formed by the manure of the cattle, in these annual peregrinations, frequently carried such luxuriant grass, that it might have been cut with a scythe. The huts in which they lived were in proportion to the affluence and rank of the different possessors: some indeed mean enough, but some others consisting of two or three apartments, besides a proper place for the milk.

They were led thus to attend their cattle in these remote situations, not only by a desire of supplying them with a continual succession of fresh pasture, but also to prevent their straying, or being annoyed with foxes and eagles and other beasts of prey.

Persons, who are entire strangers to the Highlands of Scotland, who have taken no pains to reflect on the state of the country and the circumstances of the inhabitants, are apt, under the impression of modern ideas of improvement or from other causes, to stigmatize the people with opprobrious epithets and to sneer at customs, which arose unavoidably

voidably from the circumstances of the times. Unmerited abuse is poured forth upon a people, with an acrimony of style, which betrays the illiberal prejudices of those that use it, and their total ignorance of the history of other nations, which must all have adopted the same practice, while in the same state of society, however much they may now be polished and refined.

The practice of going to these *Shealings*, as they were called, still remains in some parts of the Highlands; and the inhabitants of two or three contiguous farms, or of one farm, according as the grazing is more or less extensive, may be seen even at this day, living in huts in sequestered vallies, attending their cattle, during the summer months. These remains of the ancient custom are however few, since the introduction of sheep stocks on a large scale into the Highlands of Scotland. Wherever the beasts of prey are extirpated or kept in check, the sheep are allowed to roam at large night and day through the mountains, without danger or annoyance; whereas formerly they were even in the summer confined every night in folds, under the immediate eye of the shepherd and his vigilant dog. Where the shealings were distant from the homestead or winter-town, (as in some cases they were removed twelve or even twenty miles,) intelligent proprietors join two or three shealings together, and let them as a grazing to a shepherd, who attends his flock, by residing all the year round on the spot, in a substantial house of good mason-work, which in many instances is covered with blue slate. The highest shealing in this county, and probably the highest inhabited land in Britain, at Dalanspiddal, on the great road from Perth to Fort Augustus, is of this description.

The people readily conform to their situation. The same
sagacity

sagacity, which dictated to the highlanders the necessity of attending their cattle from valley to valley, in these rude times, now directs them in general to a very different conduct. Since the culture of potatoes and of flax became so common, and various other improvements have been introduced among them, which require the persevering labour of the industrious, the farmers find employment for themselves and their families at home, during the season which they had been accustomed to spend among the hills. They are changing from the pastoral to the agricultural life; which all nations must do, that shall ever become farmers. And it is to be hoped, that the period is not distant, when the proprietors of highland estates, who have public spirit, will establish villages in proper situations in the very heart of the Grampians, and establish woollen manufactures: which would meliorate their own properties, and preserve the population of the country. It must however be acknowledged, that the Highlands are better adapted for grass than for grain, and that the pastoral life must prevail among the inhabitants.

Here is scope for exercising the genius, the enterprize and intelligence of the possessors of large estates, to plant *manufactures* on a liberal establishment in promising situations, to encourage *agriculture*, where the soil is favourable for raising crops, and to allot the rest of the country for rearing *cattle*. This extensive tract of the island never will be in the most productive state, either to the landlord or the community, until these three modes of occupying the land shall be conjoined and engrafted on each other, selecting the particular spots which are favourable for each. Judgment and sound sense, in the management of an extensive property in the Highlands, is manifested, not by running headlong into any one system, on a whole estate, which a plausible theorist,

who

who is endowed with fluency of language and an engaging manner, but yet is utterly ignorant of the country, of the climate, of the genius and habits and circumstances of the people, may endeavour by his address to put into the head of a great proprietor. In districts or in particular farms, calculated for raising corn, the arable system ought to be adopted and encouraged: It would be preposterous and cruel to throw them into grass. In districts or farms, which nature never intended for grain, the pastoral system ought to be preferred, the species of stock suited to the soil ought to be studied, and a good breed introduced. In other spots villages ought to be established on a liberal plan.

The manufacturer, the artificer, the farmer, the labourer, the grazier, mutually support one another and minister reciprocally to one another's necessities. Every hand shall be employed, every want supplied, every mouth fed; and industry, the parent of contentment and plenty, wave her golden scepter over all the land. Whoever wishes to behold the increase of the public good shall see with joy the smile of prosperity gladden the face of his country: and the gentlemen of property shall feel not only the profit, but the satisfaction of being the immediate cause of all this happiness.

The shealings, that we have been speaking of, were for the most part set down in favoured situations, at the head of a small lake, on the banks of a river or at the confluence of brooks, where the benignity of nature had provided shelter, had made the surface green and the grass rich; but when the inhabitants were obliged to establish shealings on spots, that were naturally covered with heath. they became as green as a meadow, to the extent of several acres around the huts, by the manure of the cattle which lay there at night. I have seen shealings have such a tract of green
ground

ground by these means, that they were afterwards converted into regular farms. From this circumstance, the name of *Newton* on the confines of the low country, and the name of *Ari* in the highlands, took their rise, without any person being able to trace the period, in many instances, at which they were occupied as shealings; that period is so remote. This shows what the proprietors of the highlands may do, by perseverance, to extirpate the heath, by means of water and the dropping soil of cattle, especially of sheep, and to cover their bleak and black hills with a verdant clothing of green pasture.

SECT. I. *Labour.*

THE price of labour has become double in this county, within these twenty-five years; some say within fifteen. The augmentation of that price depends chiefly on three causes; the increase of wealth, whether real, by commerce, or fictitious, by paper currency; the demand for labour, by the progress of improvements; and the establishment of manufactures on a large scale. The first lessens the value of money: The second creates more work, which always enhances the price of labour to the employer: and the third diverts labour from its former channel. The pulse with regard to the increase or decrease of the price of labour may be felt, by attending to one circumstance: when the employer solicits, which may happen, either by the labourers becoming fewer or by the employers becoming more numerous, the wages must rise; the opposite cause produces their decrease. Competition operates against the side, on which it takes place: whether it be the employer or the employed.

The complaint occasioned by the increase of the price of labour is in a great measure imaginary. He that performs
the

the work, pays for every thing he needs either to himself or his family, in proportion to the augmentation of his wages: and he, that pays the labourer sells every thing he has to dispose of, dearer in proportion to what the labourer costs him. These matters generally find their own level.

Wherever manufactures flourish, the price of labour must rise; and when the earnings of the labouring class of mankind are augmented, their luxury will increase and keep pace with their wages. If manufactures should receive a check, by the market being overstocked, or the buyer being unable or unwilling to purchase, or by failures among the manufacturers at home, or by commerce being crippled, this luxury, which rests on such an unstable foundation, cannot be gratified; which is the cause of all the tumults in manufacturing towns.

By the great demand for labourers from this county to the towns and villages, which almost without number are situated on the three greatest rivers in Scotland, of which two are in the county and the third near it, the price of every kind of labour has increased and is still increasing with rapid strides.

A man servant, who is master of all the operations in farming, receives in the corn-country, between eight and twelve pounds, for twelve months. In the grazing districts, more remote from the seat of manufactures, their wages, and the price of all kinds of labour are about one fourth lower.

In many cases the servants are maintained in the farmer's family; but the practice of giving them six and a half bolls of meal, together with a house, a garden and a cow's grass, free of rent, and some fuel, is daily becoming more general. These farmers, who keep any married servants, have them all on this establishment of livery meal.

Maid servants live all in their master's family, and are engaged for betwixt three and four pounds, and in some cases five pounds of yearly wages, according to their expertness, and the nature of their work.

Common labourers earn between one shilling and one shilling and three pence a-day; and if able bodied and handy, they demand one shilling and six pence, without victuals. The various denominations of artificers charge according to the nicety of their art.

The hours of labour from the vernal to the autumnal equinox are from six to six, allowing an hour for breakfast and another for dinner; and during the other half year, from the dawn of day till the light fails at night, with an allowance of one hour for breakfast. Household servants are not so exact, with respect to hours: in the long days, they continue to work after six at night; and in the short days, they get out of bed, before day light, where there is much grain to thrash. But in many of the large farms, thrashing machines have been erected: and they are such a great saving, by the abridgement of labour, that more of them are set up every year, in different parts of the county.

The reapers in harvest are hired, either by the day, or by the season, or by the acre. When they are hired by the day, their wages depend on the situation of the weather, on the ripeness of the crop and on the numbers, who offer their services. At an average they earn as other labourers, allowing a deduction for their maintainance. In some cases reapers work for a penny or one penny half-penny the hour, without victuals. When shearers are hired during the harvest or reaping season, the men generally engage for about thirty shillings: the women for about twenty: but every year their wages are rising. It is only in the grain countries

and

and upon extensive farms, that reapers get these wages. In the hilly countries the wages are less. In a few instances, both the corns and the hay are cut down by the acre; the former at six shillings and the latter at three.

Mr Donaldson is so accurate with respect to the practice of carrying on the spring and harvest work in the Carse of Gowrie, that I shall insert what he says on that subject, in his own words. "Though this district is perhaps as closely inhabited and as well peopled as any other of the same extent in Scotland, where no large manufacturing towns are situated, and though the great body of the people are employed in husbandry, yet it is certain that the price of labour has, in the course of the last thirteen years, risen to nearly double what it was before that period; nor could the extra-works, such as turnpike-roads, planting, inclosing, draining, &c. be carried on but by the means of strangers, of which a considerable number come here every spring from Inverness-shire and other northern counties, each of whom returns to his own country about Martinmas with eight or ten pounds in his pocket. There is no doubt but the young people of both sexes, in this district, are induced to go into the manufacturing towns of Perth and Dundee, in consequence of the high wages they receive; and therefore, though it is evident that the vicinity of these towns is advantageous to this district in point of ready markets, yet it is also evident, that the same cause has tended to raise the price of labour very considerably."

"The ploughmen get out of bed in winter by the dawn of day and are employed in the stable till nine o'clock, in feeding and cleaning, each his own pair of horses; after breakfast, the ploughs or carts are in employment for the remainder of the day, reserving only as much light as may

suffice for repeating the operation of feeding and cleaning the horses. When the more busy season of the spring sets in, the plough is more diligently plied, being under yoke from nine to ten hours, with a short interval of an hour, about nine in the morning, and a similar rest about two o'clock. In the barley feed-time, and during the summer and harvest months, the ploughmen get out of bed by four in the morning; they are in the stable by five o'clock, and unyoking about ten, are employed in cutting grafs, and taking care of the horses until two o'clock, when they again get under the yoke until seven at night."

"The food of reapers consists of bread and small beer for breakfast and dinner; and for supper pottage of oat-meal, salt and water, with an English pint of sweet milk or double that quantity of butter milk."

"The farmer sends a quantity of meal to the bake-house, which is returned at the rate of twelve loaves from each eight pounds of meal, which affords breakfast for twelve reapers, with the addition of two English pints to each; and for dinner three pints are allowed to the same quantity of bread."

"When the farm servants are employed in carting the corn to the stack-yard (for here they are never employed in reaping) they are maintained along with the reapers, and their allowance of meal proportionally deducted. Estimating the meal at one shilling per peck, with one half-penny for baking, the beer at three pence, for eight pints English, with one half-penny for milk, the expence of maintaining a reaper, for one day, amounts to six pence three farthings."

"All the economy regarding the maintainance of servants has been more particularly detailed, because it is obvious, that where a number of them are employed, all murmuring
and

and discontent on account of diet, is avoided, of which the farmers in other countries have such reason to complain, as the caprice of a single individual, respecting the quality of his food, often breeds a ferment in the family; and the modes of diet, in the families of more opulent farmers are by this means obtruded on their poorer neighbours, and extravagance in the maintainance of this class is from year to year increased. It is also obvious, that while both parties, in this country are better satisfied, the expence upon the whole, all circumstances taken into the account, must be very considerably less."

SECT. II. *Provisions.*

THE price of meat of various kinds is much upon a parity in all the districts of Perthshire, with this difference only, that the nearer to towns, these articles sell dearer, and in the more inland parts of the county, they are cheaper. In the highland every man rears, on his own farm, what butcher meat his family requires; and the cottagers, labourers and tradesmen of these districts, who do not rear cattle, seldom make use of a flesh diet, except in the winter season. In the town and villages of the low country, many will purchase, who do not rear. This constitutes the existence of all markets, both for butcher meat and every other article. Wherever the demand is greater than the home-produce can supply, that demand must be supplied from other places, and the price of the commodity rises in proportion to the eagerness of the demand.

The average prices of beef, mutton, veal and lamb, for several years past, are from three pence to four pence, and sometimes five pence, the lb. of Dutch weight, according to the quality or scarcity at different seasons. In the year 1796 indeed, the price of every article of life was higher, owing to

an apprehension of scarcity; and meat of all kinds was two pence the lb. dearer than usual. Cattle of all kinds sell better during war than they do in the time of peace, because of the enormous quantity of beef necessary for victualling the Royal Navy. Our Armies are supplied generally with provisions, by Commissaries who attend them in the countries, that are the scene of action: the navy for the most part from Britain and Ireland.

The price of butter is from ten shillings and six pence to twelve shillings, and some years thirteen shillings and four pence the stone. In the year 1796 it cost fifteen shillings. The cheese is generally sold for five or six shillings and sometimes higher according to circumstances. Both are sold by tron weight, having twenty-two ounces to the lb.

The average prices of grain are, of wheat twenty-one shillings the boll; of pease twelve shillings; both sold by the same bushel. The price of oat-meal fifteen or sixteen shillings, the boll, weighing eight stones Dutch; of barley sixteen shillings, and of oats twelve shillings, by the Linlithgow measure. In Monteath these grains fetch one or two shillings more by the boll, owing to the demand from the manufacturing and crowded towns, along the Clyde, and the shortness of the carriage thither; besides that the Stirling furlot, which is the standard in the Stewartry of Monteath is three lippies in the boll larger than the Perth measure, which prevails in the other districts of this county. This large furlot was introduced into Monteath, when the court resided at Stirling, upon the forfeiture of the Duke of Albany and the annexation of his lands to the crown, at which period this Stewartry was bound to supply the King's house hold in grain. Meal is sold by the same weight over all the county.

Mr Donaldson says that the grain sold, from the Carse of
Gowrie

Gowrie alone, to corn merchants who export it to the frith of Forth, Glasgow or the London market, may be estimated at 10,000 bolls of wheat, 10,000 of barley, and 2,000 of pease and beans; and the remainder, beyond the consumpt of the inhabitants, which is more considerable, is disposed of in the towns of Perth and Dundee.

In the Highlands, meal used to be dear and butcher meat cheap, for the very reason that the last is generally dearer and the first cheaper in the lowlands. But during the year 1796 and the one preceding, the tables were entirely turned. Grain was indeed dearer than usual in the Highlands, but not near so dear as in the districts towards the east coast. Oats and barley were consequently poured down from the Highlands of Perthshire in great quantities towards those provinces of the county that are called grain-countries, and brought a higher price, besides the expence of a long inland carriage. This is a phenomenon altogether new in this country, neither mentioned in history, nor handed down by tradition, nor expected to be seen by any man alive. Whether the cause of it be the vast cultivation of potatoes in the inland districts of the Highlands of Scotland, by the advice of the Board of Agriculture and the admonitions and example of their ministers, for whom the people have the highest veneration, or to smuggling of grain from the low country by illicit exportation, carried on by speculators on the sea coast, I take not upon me to determine. It may be owing partly to the influence of both these causes, and to the forestalling of barley by the great distillers.

The restriction imposed upon distilling spirits from grain in the year 1796 had the happiest effects, not only in every part of this county, but over all the kingdom. The change wrought on the morals of the lower classes of people was e-

very

very where apparent and salutary. The additional supply of human food was great, and in place of idleness and riot, of intemperance and disease, more work was done, better health was enjoyed, and illegal combinations for treasonable purposes were not heard of. This wise and humane measure of government was not however followed out with the promptitude it ought. There was a fault in the execution somewhere. Full four months elapsed in some provinces, in not a few, five months were suffered to pass over, from the promulgation of the law, before a single smuggler was cited before the justices of the peace, to learn their fate and feel the weight of the penalty due to their practices*. During this period of illicit distillation, the grain was consumed in this part of the island, beyond any example of former times. The smugglers accounted this season to be their harvest, whether it was a harvest to others I shall not say. The stills were seized occasionally and the spirits carried off. But what injury was it to a smuggler, who understood this trade, and had a number of stills at hand, to lose a still made of white iron, in the course of a few weeks. His profits after all were immense, because he paid no duty and sold his spirits at three times their former price.

In this and all other northern latitudes, the drinking of ardent spirits may perhaps be necessary to correct the effects of the climate and in some degree natural to the human constitution. Perhaps the present state of the rents of arable farms may require that the tenantry should be supported and grain kept up by allowing distillation on a large scale; perhaps the habit already contracted is so inveterate, that unless spirits are distilled at home, corresponding to the consumpt,
it

* The length of this shameless delay may easily be discovered by comparing the promulgation of the law, with the date of the first excise-court in each district of the county.

much of our money would be sent abroad to purchase that article.

It is not in the line of my study, nor do I pretend to understand matters of excise, but to a plain man it would appear, that if there was one still of a specified size in every parish (allowing the towns a number of stills in proportion to their parishes) and such a duty exacted as put it out of the power of the distiller to sell his spirits under twelve or fifteen shillings the gallon, in place of four or five shillings, as formerly; the farmer would have more advantage, by receiving his share of the profits arising from fifteen shillings for the barley that produced one gallon of spirits, than he could have from his share of the profits of fifteen shillings, when it required thrice the quantity of spirits and thrice the quantity of barley to produce that sum. I add farther that two thirds of the grain distilled according to the present practice, would go towards maintaining the lieges. What an incalculable supply of human food! The present* reformation in the manners, in the industry and in the peaceableness of the people, which gives so much joy to every good man, would not be temporary, like a gleam of sunshine between two thunder storms; it would be permanent, and become, in time, habitual and highly conducive to the national prosperity. The distillers would complain loudly, if the duty upon distillation were to be raised higher. They complain of it at the present rate: But their complaints are not more loud, than they are absurd and groundless. Every person knows, and they know, as well as others, that the consumer ultimately pays the duty upon all commodities subject to sumptuary laws.

Mr Marshall says on the subject of provisions, "that a

Y y

vegetable

* This was written in the year 1796.

vegetable diet, with milk and its productions, prevails throughout the Highlands. Animal food is rarely tasted by the lower order of tenantry*. Oat meal is the great support and strength of the Highlander, and is probably the most substantial of vegetable foods. Bear, big or four rowed barley, nevertheless enters largely into their diet; especially in bread; pease too are eaten in a similar shape, namely in thin flaccid cakes, called bannocks, the ordinary bread even of the gentry or lairds†. Of late, potatoes have become a principal food of the common people, especially in winter; and are considered as the greatest blessing, that modern times have bestowed on the country; in having it is probable, more than once, saved it from the miseries of famine &c‡. Meal is every year, I believe, brought into it, and some years in considerable quantities.”

Every circumstance, which affects the price of grain is closely connected with the subject of provisions; I shall therefore,

* The tenants and even the poorest cottagers, where I am acquainted have animal food, in winter and spring, and some in autumn. A cottager buys from two to six old ewes, to eat with his potatoes. The tenant has several from his own flock; better tenants kill a fatted cow for salt beef, besides some mutton. *The Rev. Duncan M'Ara Minister at Fortingal.*

† Barley bread is the ordinary bread of high and low, sometimes cakes; little pease are sown; persons of considerable property have always flour bread. *The Rev. Mr M'Ara of Fortingal.*

‡ A year of scarcity is but rare, since potatoes were cultivated in such quantities. Except the year 1782, when there was a general dearth, I remember none for twenty years backward. Scarce any meal at all is brought from the low country. This district (*Breadalbane and Fortingal*) according to my best information, sent upwards of two thousand pounds worth of grain, last year to the ports of Perth, Stirling and Strathearn. I fancy they will raise sufficient for their consumption. *The Rev. Mr M'Ara of Fortingal.*

therefore, without entering at any length upon the consideration of the corn-laws, state an observation or two, which have occurred to me, and appear to have some weight.

Under the heavy and increasing expence of an arable system, and subjected as we are to the disadvantages of a rainy climate, it must be of importance to foster the prejudice, which the Scotch farmer has in favour of that system; because, if he is once driven from it, and taste the sweets of a grazing one, he will hardly be persuaded to plough more than is necessary for the accommodation of his own family. He well knows, that although grain can be brought from poorer countries, in respect of money, than his own, to compete with his production in that article, that cattle and sheep cannot: and that since potatoes are so universally raised, butcher meat and this root must soon regulate the price of grain. For this reason it might probably be a wise measure in the legislature, to contrive the corn-law so as not to shut or open the ports partially or even generally, upon the simple data of one high or low price, but rather that the pulse of the market should be felt, by a gradual opening or shutting of the ports; That the price at which the ports should be opened at all, should be a moderate one; that then foreign grain should be admitted under a duty, which just enabled the importer to sell it at the market price; that this price should be ascertained monthly, and the import-duty decreased, as the home-market price was raised.

To encourage the farmers to sow as much every year, as was likely to produce a quantity of grain sufficient for the consumption of the country even in a bad season, a premium on exportation should take place, when the price of grain fell very low, which low price should also be ascertained by

act of parliament ; and the premium on export ought to be increased, as the home price fell lower.

These regulations, it is presumed, would render the prices of grain less fluctuating, at least never verging to extremes : and have also the same effect upon wages ; giving the farmer in various respects a more distinct view of the returns, which he might expect, from operations, that necessarily demand both a length of time and a great advance of money. In a political point of view, it would be extremely salutary, to keep grain nearly at an equal price, because such a measure would prevent irritation in the public mind, and remove the frequent cause of tumult and outrage ; and the keeping wages yearly at the same rate, would prevent dissipation and idleness, which are the consequence of grain being too cheap, and of many distressing difficulties to the labouring and manufacturing part of mankind, when it happens to be too dear.

SECT. III. *Fuel.*

SINCE the roads have been improved, pit-coal has been carried far into the interior parts of the country, from the coal-works, which abound in the county of Stirling, and from some that are in this county, in both of which the coals are sold by measure, and also from the ports of Perth and Dundee, where they are sold by weight, 40 stones costing generally three shillings and six pence, and sometimes more. The gentlemen and the superior class of farmers use coal mostly for fuel to their families, even at the distance of thirty miles of land carriage. When moss is convenient, which happens even in some places of the low country, the middle ranks use peats, or coals occasionally, either mixed or separate : and the poor seldom any thing else except peats.

But

But in some districts, such as the Carse of Gowrie, where moss is very distant, both poor and rich must depend on coal.

It was formerly taken notice of, that in all the vallies of the Grampians, especially where they open to the low country, there are many oak-woods, and that the proprietors of these woods cut them in lots at a certain age. This peeled copse-wood makes excellent fuel, to the districts, in the neighbourhood. The valuable timber is disposed of otherways.

Mr Marthall says relative to the fuel of the Highlands, "that it is not the actual cost of fuel, which is a grievance; as in no other part of Great Britain perhaps, is fuel so cheap. It is the uncertainty of procuring it, and the mode in which it is at present procured (as interfering with the works of husbandry, in the most essential season) which call for the attention of proprietors: nor is it the accommodation of the tenants alone, but the future state, and perhaps the existence of the source of Highland fuel, which demands attention.

"At present every man, whether farmer, crafter, cotter or villager, manufactures and fetches home his own peats. Each little district has its own moss, or peat-bog; and each individual his separate pit; thus over-running the entire moss, and wasting perhaps more than is brought away. The mosses generally lie at three to five or six miles from the habitations, and at a great elevation above them, up which each family has to climb repeatedly, to cast or cut out and to sit or dry their peats; and down which they are brought, always in small parcels; every man bringing down his own; through which means the country becomes burdened with an unnecessary number of horses.

"The

“The remedy appears, to me, to be certain and easy. Leave off the mosses to *Peat-makers*, and establish manufactures of peats as of bricks and tiles.” So far Mr Marshall; and it were devoutly to be wished, that this scheme were practicable: but the dry season of some summers is in that country so short and uncertain, that every house-holder thinks he has little enough opportunity of providing peats for his own family; and it happens frequently that he is taken short, before that end can be attained. What would then become of those families, which trusted to the peat-market. They must perish. I subjoin in a note, the remark of a gentleman, who knows the Highlands of Perthshire as perfectly as any man alive*.

A remedy that may and ought to be adopted over all the Highlands of Scotland, to prevent the distress occasioned by a scarcity of fuel, after a rainy summer, is the practice of many provident farmers in the county of Aberdeen, and of some persons in this county, *to have peats sufficient for the consumption of two years lying beside them at the end of every dry summer.*

* The remedy appears to be worse than the disease. This plan seems to be impracticable. Owing to the high elevation of the mosses, they are commonly frosted till about the 8th or 10th of June, and while in this state, it is impossible to cast them. They must be cast, however, by the 20th or the latter end of June, otherways, there will be no drought to dry the peats. They must be brought home in July, for if the August rains come on, they are commonly lost for that season.—Besides, where would undertakers find hands for cutting and drying peats for a whole district. Fewer hands than are employed, *in the proper season*, by the present mode, could not possibly perform the labour; and would not these hands turn out very high priced, if engaged by undertakers? The roads are also destroyed by the autumnal rains, and become frequently impassable from the mountains, after that season. *The Rev. Mr Maran of Fortingal.*

summer. By this precaution the inhabitants of any district cannot be disappointed of fuel almost in a whole century : and the labour is uniformly the same, except in the first year that a double quantity of peats is provided.

It is very practicable and would prevent the exhaustion of moss, that the mode of cutting peats were regulated ; that an overseer were appointed to every district, who would take care, that the moss was consumed in such a manner that the water went freely off, and no stagnant pools were left, which frequently endanger the lives of cattle, and that every person were confined to his proper place, instead of leaving the inhabitants at liberty to dig pits at random, wherever their fancy might lead them.

CHAP. XV.

POLITICAL ECONOMY, AS CONNECTED WITH OR AFFECTING AGRICULTURE.

THE internal improvements in any country never come single. One improvement suggests another, and is frequently the cause of that which follows. The genius and industry of a people requires to be roused ; but by whatever mean they are stimulated, their enterprize never stops at one object. Security in the enjoyment of property naturally leads to the desire of wealth. This desire of wealth leads to the practice of industry ; affluence begets the desire of accommodation, and this introduces a taste for the fine arts. The progress of agriculture and of commerce promotes intercourse between nations and between different provinces in the same nation, and paves the way for the improvement of roads.

SECT.

SECT. I. *Roads.*

THE state of the roads in various parts of the county depends on various causes. Wherever the gentlemen are active, materials conveniently found, and the tenantry roused to a just sense of the importance of good roads, to facilitate the conveyance of their grain and other commodities to market, and to bring home lime and coals, the roads are tolerably good and daily becoming better.

The first thing that opened the eyes of this country to discern the benefit of proper roads was the wise plan of government in carrying on the military roads, about half a century ago; one of these from Stirling to Fort William, by Callander and Tyndrum, another northward through the heart of Scotland, from the same place to Inverness and Fort George, another in a direct line across the country from Fort George to Fort William, and a fourth, which is a diagonal line, diverging from the Inverness road to Fort Augustus, and taking its departure at Dalwhinnie, in Badenoch, through the wildest and most stormy mountains in Scotland.

The two principal lines of these roads hold the direction of this county, the western one for 60 miles, and the northern to near one hundred.

Mr Donaldson says "that before the year 1735, the public and parochial roads in the Carse of Gowrie were in a most wretched condition. About that time the roads, all over the country, had fallen into such a state of disrepair, as convinced every person concerned in this branch of police, that under the act of parliament 1669, which authorised the Commissioners of Supply to call out the inhabitants to work six days each year, together with their horses and carts, it

was

was impossible to make the roads in any degree tolerable. It was therefore agreed, at a county meeting, to apply to Parliament for a particular road act; and accordingly, the bill was very soon after passed, by which the county was divided into districts, and powers were granted to the Commissioners of Supply in each district, to convert the ancient statute labour, at the rate of twelve shillings for each sixty acres of arable land. The gentlemen entrusted with the execution of this act of parliament, in that part of the county of Perth, after a very attentive discharge of their duty for some years, found that in such a deep clay soil it was impossible to make the public roads, leading from Perth towards Dundee, and to the harbours of Polgavie and Errol, without a much greater sum than could be assessed under this last mentioned act of parliament.

“ The gentlemen of the Carse of Gowrie district being at last perfectly satisfied, that without procuring a turnpike bill, all their exertions to make good roads would be in vain; they represented, at the county meetings, the necessity of making another application to parliament, and in a short time a turnpike act was procured, in which, these and other particular roads in the county were included.

“ This bill was no sooner passed, than the proprietors of this district agreed to open a subscription for beginning this very important improvement. Accordingly a subscription of upwards of 3000*l.* was very soon filled up, and the work begun; and some time ago entirely completed, much to the credit of the proprietors, and not less to the ease and comfort of the inhabitants.

“ The great road leading through this county, from Perth towards Dundee, and the branches leading to the harbours of Polgavie, Errol, and Inchyra, measure twenty four miles;

and when finished, with all the necessary bridges, and including the purchase of some land, where it was necessary to form some new lines of road, cost 13,000*l.* or 54*l.* 13*s.* 4*d.* each mile.

“Since the turnpike roads were finished, the Commissioners of Supply of this district have paid particular attention to the cross-roads, and there is little doubt but the whole of the roads, in this corner, will soon be equal to any in Scotland.

“In order to evince the importance of this improvement in an agricultural view, it should be observed, that it was very common to send the grain to be shipped at Polgavie and Errol on horseback, and three or four firlots of barley was the ordinary load; and that now it is not extraordinary to see ten bolls of barley carried on a cart drawn by two horses.

“It may just be necessary to add, that a road from Longforgan, by Polgavie to Errol, and from thence to the turnpike-road near the church of St Madoes, would be the means of opening a communication from that part of the district, called the Low Carse, to the towns of Perth and Dundee; and from the present active spirit of the Trustees, which is aided by the principal farmers, who are now convinced of the great advantage of good roads, there is no doubt but this very important object will soon be attained; as it seems to be the opinion of both proprietors and tenants, that application should be made to Parliament for leave to borrow money for executing this work, upon the security of the sums annually collected, in lieu of the statute labour, from the tenants who reside in the neighbourhood of that line of road.

“A few years ago there were no toll roads in the county of Perth; at present there are many; some of them completely

pletely finished, and others in great forwardness. Besides the road betwixt Perth and Dundee, of which Mr Donaldson has given the detail, there is another between Perth and Coupar of Angus, another from Crieff to Perth, and that between the latter place and Dunkeld. The road from Kinross to Perth, by the bridge of Earn, is partly in this county, and at present is undergoing very judicious improvements. The road from Stirling to Crieff is well advanced; and the direction is greatly improved, when compared to that adopted by the military engineers, at its first formation. The road from Perth to the Stormont, by the bridge over the Isla, at its junction with the Tay, is begun with spirit; and that which was mentioned in my Report in the year 1793, to have been projected from Stirling to Culrofs, is carried the length of Clackmannan; which is not completed, until it proceed eastward through the Culrofs district of Perthshire and join the Fife roads.

New toll-roads, from Stirling to Callander and from Stirling to the Port of Monteath, are in agitation; and Captain Wilson has been employed to point out the best direction.

It is not improbable, that there will soon be a toll-road between Crieff and Comrie; between the latter and the bridge of Ardoch, which would be of unspeakable advantage to the west end of Strathearn; and between Blackford and Dunfermline, which would facilitate the access of the central districts in Strathearn and of the northern Glens to the nearest coal. And if a turnpike were carried from Perth by Auchterarder to join the bridge of Ardoch road, somewhere near the house of Sir William Stirling, the lower parts of this county would be well served, and the access easy, in all directions.

The present Earl of Breadalbane has some years ago made a new road, sixteen miles long, on the south side of Loch-tay; the former road made by his predecessor having been on the north; which enables travellers to enjoy different views of that charming lake and of the diversified scenery around its wooded banks. The Dukes of Athol have been at much expence with the road from Dunkeld to Blair. The former direction was frequently changed, to avoid pulls, and where the hills were small they have been cut through, and their face covered with green sod, which has a fine effect. Where the appearance of the country was exposed or naked, plantations were made at the Duke's expence, on land which was not his own property.

By a little attention, all the loose stones might be thrown off a road, and all the large stones that shoot up through the gravel, might be picked out. The rain water that falls upon the road itself, or that which oozes down from a hanging bank ought to be thrown off by a drain to the lower side, and not left to collect into a rill in the middle or upper side of a road, which will soon wash away the gravel, where the declivity is long.

Improvements upon roads are frequently an alteration of the line; and in some instances, the direction is changed two or three times, at one place; every new direction a little better than the former: and several changes are made, before the best possible line be adopted. This shifting is occasioned either by the humour or ignorance of the engineers, and is itself the cause of much unnecessary expence to the public, and of much labour thrown away. Were the managers of roads impartially to choose, in the first instance, the best direction, which is generally evident, or to employ a skilful engineer, who had no bias, to choose

it

it for them, all future labour bestowed on that road would be usefully applied.

It is almost impossible, and perhaps unnecessary to give a detail of the cross or by-roads in this county, and to ascertain the degree, in which they are more or less useful, more or less in repair, better or worse conducted. There seems in general to be too many roads; which puts it out of the power of the Commissioners of Supply to pay the necessary attention to them all. Wherever a country is thinly inhabited, the roads must be in bad order, because the labour is great and the labourers are few. This is the case in many parts of the Highlands, with respect to the cross roads, which pass over the hills and form the communication from one valley to another. Nevertheless, when the great roads in the lower districts of the county are provided for by the tolls, and the great military roads, which penetrate into the Highlands, are properly cared for by the inspectors appointed by government, (which of late has been done with more fidelity than formerly,) the assessment, arising from the statute labour, will be more effectual in meliorating the condition of the remainder of the roads in every province.

The effect of the statute labour, whether it be commuted in money, or exacted in kind, has always been, now is, and probably shall continue to be, less productive than it might, owing to various causes. Some of these shall be pointed out; and yet there is no sanguine hope, that these causes shall be removed or the voice of an individual listened to. The contagion is so general, the malady so deeply rooted, and the passions and interests of so many conspire to perpetuate the evil, that it seems to be almost incurable. There is such a number of grieves, inspectors and overseers appointed in every little district, and every one of these must

have

have a salary, that a considerable proportion of the public money is diverted from the purpose, for which it was, by the law, intended. Unless they be uncommonly upright, there is great room for defalcation: and unless they be uncommonly unbiassed, there is scope to relax in the demand of labour with respect to some of the workmen, and to be too rigorous in exacting the labour of others. Without saying that these overseers are not always chosen according to their experience or knowledge in road-making; without saying that they neglect their business, or that their numbers are more than necessary; without saying that it is impossible for the Commissioners of Supply, in auditing their accounts, to know, whether the money which is raised, can be fairly accounted for, unless every individual in the district is called before them, to learn who has paid money and who has performed labour; the thing itself is an error.

Might not gentlemen with more ease and more effect, contract with an improved road-maker at a particular price by the mile, and on certain conditions, according to the circumstances of the road, in order to bring it at once to the state, which corresponded to the local situation of the inhabitants and to the importance of the road, and by a second contract, at so much the mile annually, to keep it afterwards in repair. This contractor would seize the first opportunity of repairing a bad step, the moment it began to fail, without allowing it to become dangerous or impassable, which would create more expence to him. He would work briskly for his own emolument, and would employ labourers to assist him, who wrought like himself. The whole country would be inspectors, whether the work was executed according to contract, and the gentlemen would only have the trouble of judging whether these remarks were well or ill founded,

by

by looking into their own agreement. This mode of applying the statute labour would remove all the languor and the backwardness, with which country people commonly perform these services, in person; would leave them at liberty to prosecute the business of improving their ground, or of working at their trade; would at once save to the public all these multifarious salaries, bring every farthing of the road money to its proper use, and prevent all the teasing applications, employed in soliciting for these little posts, which are never sought for, but with a view of influence or emolument, or both;—posts, which an industrious man is better not to have, by being left at full liberty to bestow all his time and attention upon his proper business.

If this method should not be approved of, there is another, which a freeholder of Hife-shire told me it was in contemplation to adopt in that county: That the commissioners of supply, as public bodies in separate counties, or in different districts of the larger counties, should borrow money, upon the credit of the statute money, amounting to such a sum, that the money collected annually from the district would be equal to ten per cent. of the capital borrowed. The money thus raised to be forthwith laid out in putting the roads in proper order: One half of the statute money, or less, according to the interest stipulated with the lenders, to be applied yearly towards paying the interest of the sum borrowed, and the remainder of the statute money, appointed partly as a sinking fund to cancell the debt, and partly applied to keep the roads in order, according to the discretion of the borrowers. An act of parliament may perhaps be requisite in order to carry this last plan into effect.

Many advantages result from either of these, beyond the present mode of exacting the legal services on the public roads:

roads; but they are so evident, that it is unnecessary to point them out: nor do I see any objection against either, except what holds equally or more strongly, against every method of conducting the business of the statute labour.

Before wheel carriages were so much in use as at present, little attention was paid to roads, and little discernment discovered in their direction, both in this county and elsewhere. One idea struck all the engineers, even those employed in conducting the military roads, in North Britain, on which it must have been intended to convey ordnance and other heavy carriages: "That a straight line is always the shortest direction between two points, and therefore the most eligible line for a road." But this opinion is not well founded. In some cases both the premises and conclusion are false; and in many cases the premises may be granted, and the conclusion denied. A straight line is indeed the shortest between two points on a plane; but over a conical hill, it is longer than a circuitous line; and over a hill which forms a hemisphere, it is exactly of the same length with a line round the half of the base: Even although a straight line were the shortest, the steepness of the ascent makes it often the least eligible for a road. Many other circumstances, besides the distance, ought to be taken into consideration; the convenience of materials, the time and labour required in travelling, especially with heavy carriages, the avoiding rocky or soft ground, and a variety of other obstructions, which may increase the first expence of a road, and render it inconvenient or endanger its sufficiency, after it is made.

Mr Marshall says, with much propriety, that the public roads in the Highlands of the county of Perth, considering the nature of the country, are remarkably level; beyond comparison more so than those of Devonshire, and other districts,

whose

whose hills are much lower. The Highland roads seldom mount or climb the hills. The Creator has providentially, in most cases, rent the general ridge of hill, which stretches along the sides of the straths or greater vallies, by smaller vallies at right angles to the great ones, so as to give an easy passage to the high way across the hill from one strath or glen to another. He adds, that another observation, equally applicable to the roads of the Highlands and those of Scotland at large, is, that they are much more easily kept in repair, than the high ways of England, where long teams are in use; because in the former, seldom more than one horse is seen in a carriage of burden; the load of course is proportionably light.

SECT. II. *Canals and Embankments.*

THERE are no navigable canals in the county of Perth. Some brooks, which ran slowly with a winding course and overflowed the adjacent ground, have been streighted; but no vessels ply upon them for the purposes of commerce.

Upon the right hand, travelling from Blairgowrie to Coupar, you see a morass, with an eminence in the middle, which was once a lake with an island. Into this island, in times of danger, the inhabitants deposited their most valuable effects, to secure them from plunder; which being therefore called the *Store-mount*, the people of the country suppose to have given its present name to that province. This lake has been long ago drained down to its present state.

Between the parishes of Callander and Balquhiddy, there was a spirited undertaking begun some years ago, and is still prosecuted occasionally, by which eight or ten feet may be drained off Loch Lubnaig, a lake four miles in length and

near one broad, which was at first understood to be carried on at the joint expence of the proprietors, whose lands were to reap the benefit, but is now carried on at the sole expence of Mr Buchanan of Strathyre. If this work is completed, upwards of fifty acres of rich land will be gained, on the sides and at the west end of the lake, to the different heritors. The river above will by these means have a better fall for several miles; and by clearing a few fords, the proprietors in that tract will be enabled to drain the swamps, which disfigure and injure their estates, and to free their land from the back-water, when Loch-lubnaig is overcharged in the rainy season; and although they are shy at present, in following out the undertaking of cutting at the lower end of the lake, yet when they shall see how much their property is benefited by the cut, there is a probability at least, that they will be disposed to contribute, in proportion to the benefit they receive. One heritor at least in Balquhiddy, who has the property on both sides of the river Balavag, between the east end of Loch-veoil and Bailfuil, may deem it his interest, to give that river a straight course, to deepen the fords and to raise embankments on the sides, as far as his property extends in that place. This operation would reclaim a haugh of two miles long and one broad, consisting mostly of fine land, which at present is overflowed once for every month in the year.

Lochard might also be drained in some degree, at the small expence of blowing a few yards of rock; by which means much land would be gained by the noble proprietor. Several feet of water might be let off the loch of Monteath, and many acres converted into dry ground, if a convenient stream could be found elsewhere for the mills, which are
driven

driven by the water of Goodie, that issues from the lake. Land might be recovered from Loch-achray at a small expence.

Previous to the year 1735, the Carse of Gowrie was disfigured by many large pools of water. The only lake now remaining is the Qua, which may cover thirty acres of rich clay land, highly susceptible of cultivation, besides a considerable extent around it, which is so much on a level with its surface, as to be injured by every flood. Since the year 1760, very considerable sums have been expended in enlarging the courses of the different streams, which flow through the plain of the Carse. But on all these streams there are mills for grinding grain, situated near the shore of the Frith, which prevent a complete draining from being effected; because in every flood the water is repelled in its course, and overflows its banks; where, in a country so level, very considerable damage is always done to the adjoining fields, particularly in seed time and harvest. At the period when these mills were erected, and when the roads were in a manner impassable, they were no doubt justly considered, as a great improvement. But now, when there is one or more, on every one of those streams, at the bottom of the hills, and some one or other of them situated within three miles of every farm in the Carse, these other mills are no longer necessary, provided the proprietors, whose land is injured by the stagnant water would recompence the proprietors of the mills in the Carse, for having them demolished.

In the course of this report, notice has been taken of several embankments, made in different parts of the county: but much more ought to be done; and as an inducement,

every one knows, that it is the best of the land, which is liable to be overflowed.

The haughs of the Isla from Ruthven bank to the mouth of that river, a distance of ten miles, are exposed to inundations, which are great and destructive. In the glens lying north of the Stormont, floods do great havoc among the hay and other crops. In Athol, at Bun-rannoch, in Glen-lyon, Glen-dochart, and Glen-lochay, torrents from the mountains swell the rivers so suddenly, that they spread far and wide, in many places, beyond their banks, and frequently sweep off almost the whole labours of the year. The Tay and the Earn, the Devon, the Allan, and almost every river, within low banks, which takes its course through flat land, brings desolation on the finest fields, which lie on its sides. But the rivers, which flow from lakes do not swell so suddenly near to these lakes; and their damage is less, in proportion to the extent of the lakes that supply them; because the lakes serve as reservoirs to hold the torrents from the mountains, and discharge them gradually.

In Athol there are many embankments formed on the sides of the Garry,* the most rapid river in the county of Perth, which consist generally of stones, laid together not in a regular curve, but nearly similar to one side of a Gothic arch. These embankments have the appearance of a strong sloping causeway, with every stone laid on edge, rising from the bed of the river, in an angle of forty-five degrees or less. In some places, the stones are laid in wooden frames, which run laterally and transversely, like the types of a printer in his frame: But however promising the appearance of these frames,

* *The flight of a dart*, according to the rev. Mr M'Lagan of Blair.

frames, and however much they may facilitate the work in the first construction, they will prove finally injurious to the sufficiency of the embankment, when the wood rots, by leaving open gaps and giving room to the stream to work its way in below the stones. This inconvenience can only be remedied, by filling up the interstices with other stones, whenever the wood begins to fail; which it must soon do, by being alternately wet and dry.

The north side of the Frith of Tay is embanked, all the way from Errol to the bay of Invergowrie, a tract of several miles. This building consists of stone; and the old part of it is made nearly perpendicular. The heritors who have lately raised that part of it, which secures their property, have given their's a greater slope. Jettees or piers are occasionally made on the outside, to throw off the current and defend the embankment. Reeds are planted in the bottom of these jettees, which are very much sought after for thatch, and sell at the rate of twenty-five shillings for every hundred bunches, each being an ell (37 inches) in circumference.

On the bank of the Isla below Meigle, at a place called Hallyards, an embankment has been made, half a mile long, with an elevation less than 45 degrees, by reason of the rapidity of the river. The base is twelve feet broad, and is set down about eighteen inches below the bed of the river. The height is seven feet of perpendicular altitude. The front towards the river has the appearance of a sloping causeway. This bulwark cost about £.300, and was erected at the joint expence of Mr Kinloch of Gourdie, and Mr Murray of Simprim.

Where the Ericht disembogues itself into the Isla, there are some embankments, on a smaller scale, partly composed

of stone, partly of earth, and partly of the branches of trees mixed with earth. Embankments have also been raised in Glenisla, at Killin, and in the neighbourhood of Callander: but this subject having necessarily occurred under the article of improvements, I refer to what has been said in that Section.

SECT. III. *Fairs.*

IN every town and village of this county, fairs are established, for the convenience of the inhabitants, in disposing of the commodities, which they wish to sell, and in purchasing what they stand in need of. Six or eight are held at Perth, mostly for horses and cattle; the May fair is allotted for milch cows. Coupar has nearly as many, for the same purposes. Alyth has four cattle markets and two for sheep. Blairgowrie and Meigle have each two cattle markets. Kinrossie has three for cattle and swine. In different parts of Athol there are various fairs for disposing of linen and woollen yarn and other commodities. In Breadalbane, Strathearn and Montcath, all the villages have their fairs, for wool, yarn, butter, cheese, meal, grain, horses, cattle, sheep, lambs, engaging servants, and reapers for cutting down the crop, &c. &c.

The most famous marts in the whole county are at Doune in the fall and in the beginning of winter for the sale of black cattle. At these fairs vast multitudes of cows and bullocks, both fat and lean, are collected from every county in the north and west of Scotland, to be disposed of to the English drovers, to Scotch graziers and distillers in the southern counties, who buy them, for eating up the clover faggage, for being stall-fed with turnips and consuming the
offal

offal of the distilleries. Such as are sent to England are kept for another season; they rise greatly in the bone, and make most delicate beef on the rich pastures of that country. At Callander, besides other fairs, there is a great cattle market upon the 15th of May, which is composed of beasts that had been wintered in gentlemen's inclosures, and in the farmers straw-yards in the neighbourhood, and also of leaner cattle from various provinces of the west and north Highlands. These are disposed of to English and south country drovers, for grass-beef, after being fattened, the same season, in gentlemen's parks and other luxurious pastures. But catalogues of the most remarkable fairs of this county being inserted in the Edinburgh Almanacks, it is unnecessary to give a longer detail.

SECT. IV. *Weekly Markets.*

EVERY town, and almost every village has its weekly market, for supplying the inhabitants with the various articles, which their families may require. Perth has a market every Friday; Coupar and Methven on Thursday; Meigle and Blairgowrie on Wednesday. The other towns observe the respective days most suitable to themselves and the neighbourhood, of which it would be tedious and uninteresting to give a particular list. Longforgan, the property of Mr Paterfon of Castle Huntly, he says, was erected into a burgh of barony, in the year 1672, by a charter of Charles the second, in favour of Patrick Earl of Kinghorn, with the usual privileges, besides that of holding two fairs in the year, and a weekly market upon every Tuesday. That property was at this period erected into a lordship, by the name of Lyon. The ancient name of Huntly is restored by the present

present proprietor, in honour of the family of Gray, with whom he is connected by marriage.

SECT. V. *Commerce.*

THIS is not a commercial county in comparison with many others. Yet our extensive pastures, in the vallies and mountains of the Grampians, send down immense droves of black cattle for sale, in the spring and fall of every year. The flocks on these, on the Ochill and Seedlaw hills, send lambs in summer and sheep in autumn, in numbers almost beyond calculation, for a supply to the southern counties in butcher meat, particularly to the manufacturing towns along the Forth and the Clyde. And since the sheep system has been adopted on a progressive scale, their numbers are annually increasing.

Linen and woollen yarn brings a great return in specie from the manufacturers of checked goods, carpet manufacturers, and others; besides what linen and woollen stuffs are wove in the country and exported for sale.

Great quantities of grain are exported from Strathearn, from that district of Strathmore included in this county. from Monteath, from the vicinity of Tullyallan and Culrofs, and from the Carse of Gowrie.

Kincardine, in the parish of Tullyallan, and Culrofs, are the only towns situated on the Forth, belonging to this county, which can be said to have any trade. To the port of Kincardine belong seventy-six vessels, which at an average, are computed between eighty-five and ninety tons. In summer, these are employed in carrying coals to London and the cities on the shore of the Baltic; and return laden with corn and wood to Leith and Sea-lock, near Carron. In winter, they carry coals to Dundee, Perth, Montrose, and
the

the towns on the north coast of Scotland. There are commonly three or four vessels on the stocks at one time. At Culrofs and Torryburn together, there are only eight or ten vessels, which are employed in the same trade.

In place of leading the reader through a long maze, relative to the trade of every particular village included in this county, I shall conclude this article with an account of the exports and imports recorded at Perth, the principal emporium in this shire, which may furnish a probable rule in forming a judgment of the growing commerce of our other trading towns: and I do this the more readily, first, because the authenticity of the statement may be relied on, having been communicated by the collector and comptroller of the customs at that port, with a readiness which does them honour, and extracted from the books of their office by Mr Will, one of their confidential clerks; secondly, because these tables will show the progressive prosperity of the country, in which every man ought to rejoice.

REV. SIR,

I communicated your request to the collector and comptroller of this port, who after considering the purport thereof, agreed that I might avail myself of the books in this office, so far as to enable me to give you some satisfactory information to lay before the Board of Agriculture, respecting the state of the town and county of Perth; and having taken pains to collect what I thought most material for that purpose, I beg leave to lay them before you, as follows:—

The importation of lime, at this port and the precincts thereof, is of such magnitude, and so beneficial to the agriculture of the county, that I presume it will be acceptable

to give a comparative statement of that article for three years in the last ten, which is as follows :

		Lime.
		<i>Cbalders.</i>
Landed in the year 1784,	- - -	2330
1789,	- - -	4940
1794,	- - -	8042

It is worthy of remark, that the quantity imported in the year 1794, is more than three times that in the year 1784. The application of lime to the soil of this county, is no doubt a great improvement, and according as the quantity increascs, so may we expect to find a proportionable increase in the articles produced. This cannot be fully exhibited in any account which I can give, as a greater part of the ground may be laid down in pasturage, turnips, &c. in one year than another ; and even the increase of corn produced, will not correctly appear, as an advance in population requires a greater consumption at home. Notwithstanding of this, an account of the quantity of corn shipped at this port and the precincts thereof, for the three years above mentioned, is submitted as deserving notice.

	Wheat.	Barley.	Malt.	Oats.	Pease & Beans.
	<i>Qrs.</i>	<i>Qrs.</i>	<i>Qrs.</i>	<i>Qrs.</i>	<i>Qrs.</i>
Shipt in the year 1784,	7,303	7,508	5305	.	300
1789,	9,005	16,802	4438	877½	1,320
1794,	2,493	35,392	6,635	1,941	1,504

The demand for corn in England and other places, as well as the high price given for that article since the harvest of 1794, has encouraged the dealers therein to send off as
much

much as the country could spare ; and there being no importation of foreign corn during the last twelve months, it is thought that an account of the corn and grain shipt from the 10th October 1794 to the 10th October 1795, will discover the greatest quantity that can be spared from this port and its precincts, in any one year, until the ground has undergone an additional improvement, and therefore, the same is here stated.

Shipt from 10th October 1794, to 10th October 1795.						
Wheat.	Wheat Flour.	Barley.	Malt.	Oats.	Oat Meal.	Pease & Beans.
<i>Qrs.</i>	<i>Cwt.</i>	<i>Qrs.</i>	<i>Qrs.</i>	<i>Qrs.</i>	<i>Bolls.</i>	<i>Qrs.</i>
12,043 $\frac{1}{2}$	7,785	36,047	9,371 $\frac{1}{2}$	14,638 $\frac{1}{2}$	2,135	3,065 $\frac{1}{2}$

As to the trade and manufactures of this town, I presume, you have derived from other sources more ample information than can be had from this office. It will, however, give some idea of the trade, to peruse the following account of the number of cargoes shipped and landed here, to and from British and foreign ports, during the three years I have pitched upon for the other accounts.

	From ports in Great Britain.	From Foreign Parts.
	<i>Number.</i>	<i>Number.</i>
Cargoes inwards, in the year 1784,	761	55
1789,	942	28
1794,	1093	42

	For Ports in Great Britain.	For Foreign Parts.
	<i>Number.</i>	<i>Number.</i>
Cargoes outwards, in the year 1784,	254	
1789,	330	
1794,	497	5

The manufactures of this place are chiefly those of flax, cotton, and leather ; I have therefore subjoined an account of the quantity of linens, cotton, and leather-shoes which have been cleared in this office, during the years 1784, 1789, and 1794.

Cleared out in Three Years.						
	Linens Brown and White.	Cottons Plain and Printed.	Shawls and Handker- chiefs.	Dia- pers.	Muf- lins.	Leather- Shoes and Boots.
<i>Years.</i>	<i>Yards.</i>	<i>Yards.</i>	<i>Dozens.</i>	<i>Yards.</i>	<i>Yards.</i>	<i>Doz. Pairs.</i>
1784	1,515,570	200				1,381
1789	2,740,800	120,954	2,726		500	1,809
1794	3,086,580	683,432	7,436	88,749	1,330	3,313

These are submitted for your information. I am,

Very respectfully,

Rev. Sir,

Your most obedient servant,

ALEX. WILL.

Custom-house, Perth,

30th Oct. 1795.

The salmon fishing upon the Tay and its branches has become an object of great importance, and the quantity carried

ried from thence to London and other markets is worthy of being included in a report of this county; therefore I shall insert Mr Richardson's letter on that subject, a gentleman, who has brought that business to a perfection formerly unknown in Scotland, who reaps the fruits of his industry and attention, and seems to be worthy of it all.

Pitfuir 21st, October, 1795.

SIR,

I now beg leave to trouble you in consequence of what passed when I had the pleasure of seeing you here.

The valuable part of the salmon fishing on the Tay is from the influx of the Isla, down to Newburgh on the south, and Errol on the north side of the river: the yearly rent of the fishings on this space is at present seven thousand pounds or within a hundred pounds of that sum. The principal heritor is Lord Gray, who as proprietor of the estate of Kinfauns draws of yearly rent for his fishings two thousand five hundred and sixty pounds.

Above the Isla on the course of the Tay up to Loch Tay, and upon the Tumble which joins the Tay at Logierait there are scattered fishings belonging to different proprietors, the rents of which I am ignorant of, but suppose them two hundred to three hundred pounds. It is to be observed that the rents paid do not bear proportion to the quantity of fish caught; for on a number of small fishings, more fish are taken in proportion to the rent than in fishings of greater consequence. The expence of fishing must be paid before any thing can go for rent: after which the benefit of the catch is supposed to accrue to the proprietors.

All the above mentioned fishings lie in the county of
Perth,

Perth, except a small part of Mr Hay of Mugdrum's, the whole of whose rent is 195l.

From Newburgh on the south, and Errol on the north side of the Tay, down to Dundee, the fishings are inconsiderable, not above 100l. of yearly rent.

From Dundee to the mouth of the river, including both sides, the rents amount to about three hundred and fifty to four hundred pounds.

Formerly the greater part of the salmon was salted and sent to foreign markets. Within these forty or fifty years, the produce has been sent to London pickled, that is boiled and preserved in vinegar, and packed up in small wooden vessels called kits. During that period, part was also sent raw to London, put up with straw in boxes.

A few years ago, a mode was recommended of preserving salmon raw in ice, in which state almost all that are caught in this river, preceding and during the month of May, are sent to London. The application of this discovery, in this county, is owing to Mr Dempster of Dunnichen; and the benefit of it, not only to the fishery on the Tay, but to the salmon trade in general, is very great.

In the mode of fishing, nothing has of late been discovered. Some alterations indeed have been made in construction of nets, and in adapting them to the state of the river, according to its size, and at different situations: As, where it is shallow and the current rapid, a net is used different from that where it is deep and runs slow. Improvements of this kind are chiefly owing to the ingenuity and attention of the fishermen, in constructing and applying nets proper for the stations, and varying them according to the rising and falling of the river. As the fishery became
more

Table 1

Year		1990		1991		1992		1993		1994		1995		1996		1997		1998		1999		2000		2001		2002		2003		2004		2005		2006		2007		2008		2009		2010		2011		2012		2013		2014		2015		2016		2017		2018		2019		2020		2021		2022		2023		2024		2025		2026		2027		2028		2029		2030		2031		2032		2033		2034		2035		2036		2037		2038		2039		2040		2041		2042		2043		2044		2045		2046		2047		2048		2049		2050		2051		2052		2053		2054		2055		2056		2057		2058		2059		2060		2061		2062		2063		2064		2065		2066		2067		2068		2069		2070		2071		2072		2073		2074		2075		2076		2077		2078		2079		2080		2081		2082		2083		2084		2085		2086		2087		2088		2089		2090		2091		2092		2093		2094		2095		2096		2097		2098		2099		2100		2101		2102		2103		2104		2105		2106		2107		2108		2109		2110		2111		2112		2113		2114		2115		2116		2117		2118		2119		2120		2121		2122		2123		2124		2125		2126		2127		2128		2129		2130		2131		2132		2133		2134		2135		2136		2137		2138		2139		2140		2141		2142		2143		2144		2145		2146		2147		2148		2149		2150		2151		2152		2153		2154		2155		2156		2157		2158		2159		2160		2161		2162		2163		2164		2165		2166		2167		2168		2169		2170		2171		2172		2173		2174		2175		2176		2177		2178		2179		2180		2181		2182		2183		2184		2185		2186		2187		2188		2189		2190		2191		2192		2193		2194		2195		2196		2197		2198		2199		2200		2201		2202		2203		2204		2205		2206		2207		2208		2209		2210		2211		2212		2213		2214		2215		2216		2217		2218		2219		2220		2221		2222		2223		2224		2225		2226		2227		2228		2229		2230		2231		2232		2233		2234		2235		2236		2237		2238		2239		2240		2241		2242		2243		2244		2245		2246		2247		2248		2249		2250		2251		2252		2253		2254		2255		2256		2257		2258		2259		2260		2261		2262		2263		2264		2265		2266		2267		2268		2269		2270		2271		2272		2273		2274		2275		2276		2277		2278		2279		2280		2281		2282		2283		2284		2285		2286		2287		2288		2289		2290		2291		2292		2293		2294		2295		2296		2297		2298		2299		2300		2301		2302		2303		2304		2305		2306		2307		2308		2309		2310		2311		2312		2313		2314		2315		2316		2317		2318		2319		2320		2321		2322		2323		2324		2325		2326		2327		2328		2329		2330		2331		2332		2333		2334		2335		2336		2337		2338		2339		2340		2341		2342		2343		2344		2345		2346		2347		2348		2349		2350		2351		2352		2353		2354		2355		2356		2357		2358		2359		2360		2361		2362		2363		2364		2365		2366		2367		2368		2369		2370		2371		2372		2373		2374		2375		2376		2377		2378		2379		2380		2381		2382		2383		2384		2385		2386		2387		2388		2389		2390		2391		2392		2393		2394		2395		2396		2397		2398		2399		2400		2401		2402		2403		2404		2405		2406		2407		2408		2409		2410		2411		2412		2413		2414		2415		2416		2417		2418		2419		2420		2421		2422		2423		2424		2425		2426		2427		2428		2429		2430		2431		2432		2433		2434		2435		2436		2437		2438		2439		2440		2441		2442		2443		2444		2445		2446		2447		2448		2449		2450		2451		2452		2453		2454		2455		2456		2457		2458		2459		2460		2461		2462		2463		2464		2465		2466		2467		2468		2469		2470		2471		2472		2473		2474		2475		2476		2477		2478		2479		2480		2481		2482		2483		2484		2485		2486		2487		2488		2489		2490		2491		2492		2493		2494		2495		2496		2497		2498		2499		2500		2501		2502		2503		2504		2505		2506		2507		2508		2509		2510		2511		2512		2513		2514		2515		2516		2517		2518		2519		2520		2521		2522		2523		2524		2525		2526		2527		2528		2529		2530		2531		2532		2533		2534		2535		2536		2537		2538		2539		2540		2541		2542		2543		2544		2545		2546		2547		2548		2549		2550		2551		2552		2553		2554		2555		2556		2557		2558		2559		2560		2561		2562		2563		2564		2565		2566		2567		2568		2569		2570		2571		2572		2573		2574		2575		2576		2577		2578		2579		2580		2581		2582		2583		2584		2585		2586		2587		2588		2589		2590		2591		2592		2593		2594		2595		2596		2597		2598		2599		2600		2601		2602		2603		2604		2605		2606		2607		2608		2609		2610		2611		2612		2613		2614		2615		2616		2617		2618		2619		2620		2621		2622		2623		2624		2625		2626		2627		2628		2629		2630		2631		2632		2633		2634		2635		2636		2637		2638		2639		2640		2641		2642		2643		2644		2645		2646		2647		2648		2649		2650		2651		2652		2653		2654		2655		2656		2657		2658		2659		2660		2661		2662		2663		2664		2665		2666		2667		2668		2669		2670		2671		2672		2673		2674		2675		2676		2677		2678		2679		2680		2681		2682		2683		2684		2685		2686		2687		2688		2689		2690		2691		2692		2693		2694		2695		2696		2697		2698		2699		2700		2701		2702		2703		2704		2705		2706		2707		2708		2709		2710		2711		2712		2713		2714		2715		2716		2717		2718		2719		2720		2721		2722		2723		2724		2725		2726		2727		2728		2729		2730		2731		2732		2733		2734		2735		2736		2737		2738		2739		2740		2741		2742		2743		2744		2745		2746		2747		2748		2749		2750		2751		2752		2753		2754		2755		2756		2757		2758		2759		2760		2761		2762		2763		2764		2765		2766		2767		2768		2769		2770		2771		2772		2773		2774		2775		2776		2777		2778		2779		2780		2781		2782		2783		2784		2785		2786		2787		2788		2789		2790		2791		2792		2793		2794		2795		2796		2797		2798		2799		2800		2801		2802		2803		2804		2805		2806		2807		2808		2809		2810		2811		2812		2813		2814		2815		2816		2817		2818		2819		2820		2821		2822		2823		2824		2825		2826		2827		2828		2829		2830		2831		2832		2833		2834		2835		2836		2837		2838		2839		2840		2841		2842		2843		2844		2845		2846		2847		2848		2849		2850		2851		2852		2853		2854		2855		2856		2857		2858		2859		2860		2861		2862		2863		2864		2865		2866		2867		2868		2869		2870		2871		2872		2873		2874		2875		2876		2877		2878		2879		2880		2881		2882		2883		2884		2885		2886		2887		2888		2889		2890		2891		2892		2893		2894		2895		2896		2897		2898		2899		2900		2901		2902		2903		2904		2905		2906		2907		2908		2909		2910		2911		2912		2913		2914		2915		2916		2917		2918		2919		2920		2921		2922		2923		2924		2925		2926		2927		2928		2929		2930		2931		2932		2933		2934		2935		2936		2937		2938		2939		2940		2941		2942		2943		2944		2945		2946		2947		2948		2949		2950		2951		2952		2953		2954		2955		2956		2957		2958		2959		2960		2961		2962		2963		2964		2965		2966		2967		2968		2969		2970		2971		2972		2973		2974		2975		2976		2977		2978		2979		2980		2981		2982		2983		2984		2985		2986		2987		2988		2989		2990		2991		2992		2993		2994		2995		2996		2997		2998		2999		3000		3001		3002		3003		3004		3005		3006		3007		3008		3009		3010		3011		3012		3013		3014		3015		3016		3017		3018		3019		3020	
------	--	------	--	------	--	------	--	------	--	------	--	------	--	------	--	------	--	------	--	------	--	------	--	------	--	------	--	------	--	------	--	------	--	------	--	------	--	------	--	------	--	------	--	------	--	------	--	------	--	------	--	------	--	------	--	------	--	------	--	------	--	------	--	------	--	------	--	------	--	------	--	------	--	------	--	------	--	------	--	------	--	------	--	------	--	------	--	------	--	------	--	------	--	------	--	------	--	------	--	------	--	------	--	------	--	------	--	------	--	------	--	------	--	------	--	------	--	------	--	------	--	------	--	------	--	------	--	------	--	------	--	------	--	------	--	------	--	------	--	------	--	------	--	------	--	------	--	------	--	------	--	------	--	------	--	------	--	------	--	------	--	------	--	------	--	------	--	------	--	------	--	------	--	------	--	------	--	------	--	------	--	------	--	------	--	------	--	------	--	------	--	------	--	------	--	------	--	------	--	------	--	------	--	------	--	------	--	------	--	------	--	------	--	------	--	------	--	------	--	------	--	------	--	------	--	------	--	------	--	------	--	------	--	------	--	------	--	------	--	------	--	------	--	------	--	------	--	------	--	------	--	------	--	------	--	------	--	------	--	------	--	------	--	------	--	------	--	------	--	------	--	------	--	------	--	------	--	------	--	------	--	------	--	------	--	------	--	------	--	------	--	------	--	------	--	------	--	------	--	------	--	------	--	------	--	------	--	------	--	------	--	------	--	------	--	------	--	------	--	------	--	------	--	------	--	------	--	------	--	------	--	------	--	------	--	------	--	------	--	------	--	------	--	------	--	------	--	------	--	------	--	------	--	------	--	------	--	------	--	------	--	------	--	------	--	------	--	------	--	------	--	------	--	------	--	------	--	------	--	------	--	------	--	------	--	------	--	------	--	------	--	------	--	------	--	------	--	------	--	------	--	------	--	------	--	------	--	------	--	------	--	------	--	------	--	------	--	------	--	------	--	------	--	------	--	------	--	------	--	------	--	------	--	------	--	------	--	------	--	------	--	------	--	------	--	------	--	------	--	------	--	------	--	------	--	------	--	------	--	------	--	------	--	------	--	------	--	------	--	------	--	------	--	------	--	------	--	------	--	------	--	------	--	------	--	------	--	------	--	------	--	------	--	------	--	------	--	------	--	------	--	------	--	------	--	------	--	------	--	------	--	------	--	------	--	------	--	------	--	------	--	------	--	------	--	------	--	------	--	------	--	------	--	------	--	------	--	------	--	------	--	------	--	------	--	------	--	------	--	------	--	------	--	------	--	------	--	------	--	------	--	------	--	------	--	------	--	------	--	------	--	------	--	------	--	------	--	------	--	------	--	------	--	------	--	------	--	------	--	------	--	------	--	------	--	------	--	------	--	------	--	------	--	------	--	------	--	------	--	------	--	------	--	------	--	------	--	------	--	------	--	------	--	------	--	------	--	------	--	------	--	------	--	------	--	------	--	------	--	------	--	------	--	------	--	------	--	------	--	------	--	------	--	------	--	------	--	------	--	------	--	------	--	------	--	------	--	------	--	------	--	------	--	------	--	------	--	------	--	------	--	------	--	------	--	------	--	------	--	------	--	------	--	------	--	------	--	------	--	------	--	------	--	------	--	------	--	------	--	------	--	------	--	------	--	------	--	------	--	------	--	------	--	------	--	------	--	------	--	------	--	------	--	------	--	------	--	------	--	------	--	------	--	------	--	------	--	------	--	------	--	------	--	------	--	------	--	------	--	------	--	------	--	------	--	------	--	------	--	------	--	------	--	------	--	------	--	------	--	------	--	------	--	------	--	------	--	------	--	------	--	------	--	------	--	------	--	------	--	------	--	------	--	------	--	------	--	------	--	------	--	------	--	------	--	------	--	------	--	------	--	------	--	------	--	------	--	------	--	------	--	------	--	------	--	------	--	------	--	------	--	------	--	------	--	------	--	------	--	------	--	------	--	------	--	------	--	------	--	------	--	------	--	------	--	------	--	------	--	------	--	------	--	------	--	------	--	------	--	------	--	------	--	------	--	------	--	------	--	------	--	------	--	------	--	------	--	------	--	------	--	------	--	------	--	------	--	------	--	------	--	------	--	------	--	------	--	------	--	------	--	------	--	------	--	------	--	------	--	------	--	------	--	------	--	------	--	------	--	------	--	------	--	------	--	------	--	------	--	------	--	------	--	------	--	------	--	------	--	------	--	------	--	------	--	------	--	------	--	------	--	------	--	------	--	------	--	------	--	------	--	------	--	------	--	------	--	------	--	------	--	------	--	------	--	------	--	------	--	------	--	------	--	------	--	------	--	------	--	------	--	------	--	------	--	------	--	------	--	------	--	------	--	------	--	------	--	------	--	------	--	------	--	------	--	------	--	------	--	------	--	------	--	------	--	------	--	------	--	------	--	------	--	------	--	------	--	------	--	------	--	------	--	------	--	------	--	------	--	------	--	------	--	------	--	------	--	------	--	------	--	------	--	------	--	------	--	------	--	------	--	------	--	------	--	------	--	------	--	------	--	------	--	------	--	------	--	------	--	------	--	------	--	------	--	------	--	------	--	------	--	------	--	------	--	------	--	------	--	------	--	------	--	------	--	------	--	------	--	------	--	------	--	------	--	------	--	------	--	------	--	------	--	------	--	------	--	------	--	------	--	------	--	------	--	------	--	------	--	------	--	------	--	------	--	------	--	------	--	------	--	------	--	------	--	------	--	------	--	------	--	------	--	------	--	------	--	------	--	------	--	------	--	------	--	------	--	------	--	------	--	------	--	------	--	------	--	------	--	------	--	------	--	------	--	------	--	------	--	------	--	------	--	------	--	------	--	------	--	------	--	------	--	------	--	------	--	------	--	------	--	------	--	------	--	------	--	------	--	------	--	------	--	------	--	------	--	------	--	------	--	------	--	------	--	------	--	------	--	------	--	------	--	------	--	------	--	------	--	------	--	------	--	------	--	------	--	------	--	------	--	------	--	------	--	------	--	------	--	------	--	------	--	------	--	------	--	------	--	------	--	------	--	------	--	------	--	------	--	------	--	------	--	------	--	------	--	------	--	------	--	------	--	------	--	------	--	------	--	------	--	------	--	------	--	------	--	------	--	------	--	------	--	------	--	------	--	------	--	------	--	------	--	------	--	------	--	------	--	------	--	------	--	------	--	------	--	------	--	------	--	------	--	------	--	------	--	------	--	------	--	------	--	------	--	------	--	------	--	------	--	------	--	------	--	------	--	------	--	------	--	------	--	------	--	------	--	------	--	------	--	------	--	------	--	------	--	------	--	------	--	------	--	------	--	------	--	------	--	------	--	------	--	------	--	------	--	------	--	------	--	------	--	------	--	------	--	------	--	------	--	------	--	------	--	------	--	------	--	------	--	------	--	------	--	------	--	------	--	------	--	------	--	------	--	------	--	------	--	------	--	------	--	------	--	------	--	------	--	------	--	------	--	------	--	------	--	------	--	------	--	------	--	------	--	------	--	------	--	------	--	------	--	------	--	------	--	------	--	------	--	------	--	------	--	------	--	------	--	------	--	------	--	------	--	------	--	------	--	------	--	------	--	------	--	------	--	------	--	------	--	------	--	------	--	------	--	------	--	------	--	------	--	------	--	------	--	------	--	------	--	------	--	------	--	------	--	------	--	------	--	------	--	------	--	------	--	------	--	------	--	------	--	------	--	------	--	------	--	------	--	------	--	------	--	------	--	------	--	------	--	------	--	------	--	------	--	------	--	------	--	------	--	------	--	------	--	------	--	------	--	------	--	------	--	------	--	------	--	------	--	------	--	------	--	------	--	------	--	------	--	------	--	------	--	------	--	------	--	------	--	------	--	------	--	------	--	------	--	------	--	------	--	------	--	------	--	------	--	------	--	------	--	------	--	------	--	------	--	------	--	------	--	------	--	------	--	------	--	------	--	------	--	------	--	------	--	------	--	------	--	------	--	------	--	------	--	------	--	------	--	------	--	------	--	------	--	------	--	------	--	------	--	------	--	------	--	------	--	------	--	------	--	------	--	------	--	------	--	------	--	------	--	------	--	------	--	------	--	------	--	------	--	------	--	------	--	------	--	------	--	------	--	------	--	------	--	------	--	------	--	------	--	------	--	------	--	------	--	------	--	------	--	------	--	------	--	------	--	------	--	------	--	------	--	------	--	------	--	------	--	------	--	------	--	------	--	------	--	------	--	------	--	------	--	------	--	------	--	------	--	------	--	------	--	------	--	------	--	------	--	------	--	------	--	------	--	------	--	------	--	------	--	------	--	------	--	------	--	------	--	------	--	------	--	------	--	------	--	------	--	------	--	------	--	------	--	------	--	------	--	------	--	------	--	------	--	------	--	------	--	------	--	------	--	------	--	------	--	------	--	------	--	------	--	------	--	------	--	------	--	------	--	------	--	------	--	------	--	------	--	------	--	------	--	------	--	------	--	------	--	------	--	------	--	------	--	------	--	------	--	------	--	------	--	------	--	------	--	------	--	------	--	------	--	------	--	------	--	------	--	------	--	------	--	------	--	------	--	------	--	------	--	------	--	------	--	------	--	------	--	------	--	------	--	------	--	------	--	------	--	------	--	------	--	------	--	------	--	------	--	------	--	------	--	------	--	------	--	------	--	------	--	------	--	------	--	------	--	------	--	------	--	------	--	------	--	------	--	------	--	------	--	------	--	------	--	------	--	------	--	------	--

ABSTRACT ACCOUNT of all the **LINEN** **CLEARs** ;
viz. from 1st Nov. 1775 to 1st

Year	Places where stamped.	Brown Linen.	White Linen.	1 S
1776.	Alyth, Crieff, Dunkeld, Inchture, Methven, Ochterarder, Perth, Spittalfield,	270,088 4,287 25,005 186,278 41,444 1,416 224,466 52,205	11,548 $\frac{1}{2}$ 36,023 $\frac{1}{2}$ 29,293 $\frac{1}{2}$ 4,080 $\frac{1}{2}$ 50,643 77,213 567,744 26,685	Price per Yard at a medium 11 $\frac{1}{2}$ d.
		805,189	803,231	
1784.	Alyth, Crieff, Dunkeld, Inchture, Ochterarder, Perth, Spittalfield,	185,651 $\frac{1}{2}$ 1,032 $\frac{1}{2}$ 23,028 234,501 2,842 $\frac{1}{2}$ 526,381 59,996	22,591 $\frac{1}{2}$ 8,997 $\frac{1}{2}$ 22,507 996 24,956 $\frac{1}{2}$ 502,793 $\frac{1}{2}$ 47,267	Price per Yard at a medium 18 $\frac{1}{2}$ d.
		1,033,432 $\frac{1}{2}$	630,109	
1794.	Alyth and Meigle, Blairgowrie, Crieff, Dunkeld, Inchture and Errol, Methven, Ochterarder, Perth, Spittalfield,	136,895 100,330 19,048 116,691 $\frac{1}{2}$ 196,121 118,861 58,487 786,528 $\frac{1}{4}$ 111,731	83,208 $\frac{3}{4}$ 3,402 50,916 47 $\frac{1}{2}$ 731,957 3,333	Price per Yard at a medium 10 $\frac{1}{4}$ d.
		1,644,692 $\frac{3}{4}$	872,864 $\frac{1}{2}$	1

more valuable, greater attention and diligence may be supposed to have been bestowed.

It is a well founded opinion, that the number of salmon on the Tay has for many years past been on the decrease. Not that the produce of each succeeding year is much less than the former. The numbers of salmon caught varies very much in different seasons. But it may be asserted that taking an average of the last nineteen years, the quantity will be found far short of the preceding nineteen. To account for this may be difficult; but the chief and obvious reason appears to be *destroying salmon in forbidden time; especially before they spawn*. Whether it is that the laws made long ago are inadequate to the purpose, or that there is want of vigour and attention in the application of them, it would be presumptuous in me to say.

I am respectfully,

SIR;

Your most obedient,

Humble servant.

JOHN RICHARDSON.

There are fishings on the Forth at Doune and at Callander, on the lower Earn, at both ends of Lochtay and in some other places; but these being so much inferior to those alluded to in Mr Richardson's letter, do not seem to merit a particular discussion.

SECT. VI. *Manufactures.*

THE linen manufacture has been long established in this part of Britain. Manufactories of leather have been also carried on extensively. While these branches continue to be followed with perseverance, industry and success, the inhabitants in particular places have turned their attention, of late
years,

years, to other manufactures, which are at present so much in vogue and are a source of such immense profit. Mills for spinning cotton by machinery have been erected at Cromwel-Park and at Stanley, the former on the Almond, the latter on the Tay, and at Deanstown on the Teath. Printfields for staining cotton cloth have been established at Cromwel-haugh, Huntingtower, Stormont-field and Tulloch. Paper-mills have been built at Crieff, at Auchterarder, at Bridge of Almond and at Woodend the property of Lord Methven, and also at Ruthven the property of the Duke of Athol, at Bridge of Allan and other places. This Ruthven near Perth is supposed to have been the seat of the earl of Gowrie and the scene of the Raid of Ruthven, so famous in the history of Scotland, when James the sixth was made prisoner in 1582 by a party of his nobility. Mills for extracting oil from lint and rape-feed have been erected at Dunblane, Auchterarder, Huntingtower, Pitcairn and Balgarnhoe-water; and a mill for spinning flax by machinery at Stanley. Extensive bleachfields are laid down at Luncarty*, at Huntingtower and Stormont-field. There are other two at Lawton†, one of which is carried on by Mr Wright the proprietor, where upwards 200,000 yards of cloth are whitened annually, and another possessed by a tenant of that gentleman at Balgarnhoe. Fields of the same kind are at Kier and at Crieff.

The

* So much signalized for a total defeat of the Danes by Kenneth III. and the rise of the family of Errol, who were ennobled for their prowess in the action.

† So denominated, because the usurper Macbeath used to come to this place, from his strong hold on Dunfinnan hill, to hold courts of Justice.

The flourishing state of the linen and other manufactures in this county may be seen more clearly from the following extract, than from any account of the number of the mills and bleachfields.

Every reader must be highly gratified to observe in the table transmitted from Mr Arbuthnot Secretary to the trustees for fisheries and manufactures, which is inserted after page 170, the same evidence of the growing prosperity of the country, which is exhibited by the account of exports and imports, taken from the custom-house books at Perth detailed under the former article. In the year 1776 the value of stamped cloth amounted to L. 82,544 : 8 : 10. in 1784 it exceeded that sum by L. 27,273 : 19 : 10½. In the year 1794 it exceeded the value in 1776 by L. 41,765 : 4 : 6.

Various other branches of manufacture are carried on with spirit, which it is difficult to condescend upon with any degree of accuracy : to particularize their extent minutely, is impossible. At Alyth, sail-cloth and osnaburgs are wrought. In some of the villages of the Carle of Gowrie, the inhabitants manufacture osnaburgs, and a coarse kind of linen which is afterwards made into buckram and hat-linings. Kincardine has two tambour-schools* ; Culrofs one ; at each

C c c

of

* The establishment of manufactures indicates the increase of industry and the growth of riches : they are nevertheless accompanied with certain disadvantages. A sedentary life enervates the constitution. Crowded habitations, without a free circulation of air, produce pulmonary complaints and languor in the secretions. A constant intercourse of a variety of characters, the profane, the lewd, the artful, the dishonest, the detraacting, the lying, all blended into one mass, has a tendency to introduce a depravity of manners, against which no vigilance can guard, and a torrent of vice which no firmness can stem. These evils are deeply to be deplored, where the two sexes work under

of which about fifty girls are employed. Many looms are in these towns, engaged in the cotton manufacture, and some weaving napery for the warehouses at Dunfermline. At Crieff leather is tanned, a tambour-school on a small scale, and a linen manufacture, at the expense of a company in Glasgow. Coarse woollens and cottons are woven at Dunblane; and at Callander the weaving of cotton goods and a tambour-school have been lately introduced. At Thornhill, leather to a considerable amount is tanned and curried. In almost every village throughout the county, the inhabitants bend their attention to some species of manufacture, suited to their genius or corresponding to their local situation. The prevailing manufactures of the county-town are mentioned in the letter from the custom-house of Perth inserted in the preceding Section.

In every little village, however small, there are artists of various denominations, who in the present state of society, when arts are divided into proper classes, are daily employed, ministering to the accomodation of the country around them. These tradesmen, in the earlier stages of society were not equally necessary, when every farmer and every other man, in the lower ranks of life, was his own carpenter, his own taylor, his own shoemaker, and his own artificer almost in every thing. This division of handicrafts will become more distinct every day, and every man will consequently become more expert in his own profession. Hence one great cause of the establishment and enlargement of villages.

Among

der the same roof, or what is worse, in the same room; and when young children are employed, before their constitution has acquired any degree of vigour, their minds any impressions of religion, or their conscience any abhorrence of vice. Add to this, that when money is easily and plentifully earned, it is generally spent without prudence.

Among all the manufactures above-mentioned none has occurred, that is devoted to the spinning of wool*, and only one upon a large scale for the spinning of flax. I hope the former, which has become of late years one of the staple commodities of this country will engage the attention of wealthy companies, and that the latter will continue to increase. Companies of professional manufacturers have perhaps declined to engage in these branches, because plenty of woollen and of linen yarn is manufactured to their hand by the country people from the raw material, and made ready for the loom. There is no county perhaps in Britain, where more wool and lint are spun, than in Perthshire. The women are very industrious. In wet weather and dry, their labour is unremitted. They are equally busy both summer and winter. The vast quantity of linen yarn wove into cloth and stamped for sale, mentioned in the table inserted under the Section on Flax; the vast quantity of linen cloth used for home wear; the vast quantity of linen yarn sold unwrought to yarn merchants, who carry it to the manufacturers of the great towns; the quantity of woollen yarn sent from hence to the carpet manufacturers of Stirling, Edinburgh, and Glasgow, besides what is wove at home and worn daily by all the ordinary ranks of society, show the industry of the women in the clearest point of view, and point it out, to be above all praise. In the course of my Survey, I saw a lady of quality spinning worsted for stockings to her husband, the yarn of which might vie with the specimens preserved in the repositories of the Highland Society at Edinburgh, spun by the Countess of Sutherland and Lady Sinclair. Another lady of some thousands a-year in my own neighbourhood was lately cut-

C c c 2

ting

* One is begun at Callander since this Report went to the press.

ting half a dozen of shirts of very fine linen, for each of her three sons, all spun with her own hands. During my Tour in 1795, a gentleman was wearing a coat of superfine cloth, made of his own wool.

SECT. VII. *Poor.*

AFTER what hath been said about the maintainance of the poor in the Section relating to poor's rates, very little is necessary to be added here. The funds therein mentioned are for the most part adequate to the support of the poor, together with their own industry, which the females amongst them seldom cease to ply, as long as they are able. But where it happens, that a parish is so extensive, and perhaps so thinly peopled, which is the case in some of the moorland countries, that the more distant parishioners come not regularly to Church, or where it happens, that many of the parishioners are not of the persuasion of the established Church*, the charity collected at the church doors is so small, that there is either a necessity for having recourse to the assessment ordained by law, or to allow the poor to beg, who are able to travel. In this case, they are relieved, by charity at the doors of the inhabitants. They receive wool, clothes and grain, as well as meal or food.

Many attempts have been made by the gentlemen, who have the charge of the police, to suppress begging; but all their efforts have hitherto proved ineffectual; because their plans were not generally adopted, and because the country-people of Scotland are so charitable from principle and
from

* There appears to be a defect in the Law or in the administration of it; that while dissenters withhold their charity from the parochial funds, they are not burdened with the poor of their own persuasion.

from habit, that they will not be restrained from serving the poor at their houses. So long as they esteem it a Christian duty, binding upon them by the highest authority, to give alms, they will persevere in this practice: and so long as beggars are served, beggars will go, in the face of every regulation to suppress begging.

The country has often suffered severely for their benevolence in this respect; and their charity is often misapplied and abused. Shoals of tinkers, gypsies, pick-pockets, vagrants and sturdy beggars pour forth upon the inland provinces from the great towns, who frequently extort too much alms from the weak and the timid; who are also guilty of theft and many other evil practices.

The magistrates of these towns imagine perhaps that they are doing *mighty* service to their country, when they banish their evil-doers from their liberties or from the county, where their town is situated. But no position can be more false, no reasoning can be more absurd, and no conduct can be less patriotic or more selfish. Why send the person, whom the wickedness of your town or county has corrupted, to corrupt, to pilfer and forn upon your neighbours? This is poor police indeed.

The establishment of bridewells is dictated by sound policy and true patriotism. Happy shall be that age, in respect of this part of their police, when a bridewell shall be built in every county and in every great town, where their own vagrants shall be confined and compelled to work for their maintainance by hard labour, instead of having them sent forth as a pestilence to the community, to fleece and annoy other counties and towns; and when the charity of the country shall be bestowed only on such objects as need and deserve their bounty.

In

In order to give an accurate detail of the number of poor in this county, of the mode adopted for maintaining them in the several parishes and of the funds appropriated for that purpose, I have consulted such of the parochial accounts as have been published; but in some of these, the number is not mentioned, in others there is no notice taken of the amount of the collections at the Church doors, and in others we are not informed, what lying stock they have, what donations they have received, nor the produce of the dues for lending the pall, nor the value of the fines for petty trespasses, which are allotted for the support of the poor.

Many benevolent societies have been established in different villages and districts of the county, which have been productive of much good. If the heritors of every parish, especially such as have not their residence within the parishes where they have lands, and therefore have no opportunity of contributing weekly for the support of the poor on these distant parts of their estates, and such heritors as are of a different persuasion from the established church; if these, were so humane, as to give a little sum, although it were no more than the legal assessment of one year upon their property in the parish, to be a fund, for setting such a society on foot, there is little fear, that the inhabitants would decline to establish a society of this kind in every parish in Scotland. The labouring classes of mankind enter into these societies with alacrity. They put a small pittance quarterly or annually into the fund, from which they are entitled to the stipulated support, when unable to earn their bread, by reason of sickness or in the decline of life.

SECT.

SECT. VIII. *Population.*

WITH regard to population, the general statement of the most intelligent persons in the county, is, that upon the whole it has increased considerably. Where the farms are enlarged, and the country inclosed, there is no doubt that the population has decreased in particular districts or farms*; but wherever married servants are kept on arable farms, and these farms are of a moderate size, there is very little, if any, decrease.

Besides

* Why decreased? If a farm is enlarged, it should be as well or better managed, than when in small farms, or the end is not answered. In all the enlarged farms I know, there are more people employed, than when they were smaller, and more produce raised, except when turned to grazing, which is no loss to the public, because fat meat is to be had, and if too much, some of the grazing farms will be turned to cultivation. Things will always find their own level.

Mr Bailey of Chillingham.

Ans. A large farm may be mismanaged, for want of capital, of industry or knowledge, as well as a little farm, and then the end is really not answered; and the loss to the public is greater.—There may be more people employed on large farms, where this gentleman is acquainted; but it is a fact, that fewer people are employed on large farms elsewhere; in some cases one family in place of four, in others two families in place of eight. I could point out in this county where one family occupies land possessed some years ago by ten families. It is to me a problem that requires proof, that the beef or mutton reared and fed on 10 or 20 acres of arable land will feed as many mouths for a term of years, as the grain which these acres will produce annually: Facts, not assertions, can determine this point.

Mr Samuel Fieldhouse has a note on this passage. It is greatly too long, otherways I would have inserted it with pleasure. He elucidates and confirms my doctrine, That very small farms, especially in *runrig*,
are

Besides public works, which have been lately established, there are in this county, upwards of seventy towns and villages, of which many have increased, within these few years to an amazing degree, not only in the number of inhabitants, but in the neatness and taste of the buildings. Some are entirely new. Several persons still alive remember Callander*, when it consisted of four families, the minister's, the schoolmaster's and some others, amounting in all to about 20 souls. There are now at least 1000, and the number is rapidly increasing. Comrie†, Crieff, Muthil, Methven,

are unfriendly to improvement, and that very large farms are inimical to population; and mentions farms of *fifty* acres as a good medium. Perhaps a farm of one hundred acres would not injure the population, where married servants are employed. But it is a fact, that beyond that, they lessen the population: and it is also a fact that all the cattle produced from any farm of arable ground in 20 or 30 years kept in grass, cannot support as many people as the same farm would do by a regular system of cropping.

* Callander was much bigger before the Rebellion in 1745, than is mentioned by the writer. *Ignorant*.

Ans. I refer not to the Rebellion in 1745, but to a period within the remembrance of persons now alive, which is more remote.

† The village of Comrie was originally an old Kirk-town, (*i. e.* the place where the parish church stood,) situated upon the north side of the river Earn, within five miles of Lochearn. It consisted of a few cottages possessed by eight or ten families, but within the last sixteen years has increased so rapidly as to contain at present about 700 inhabitants, many of whom are wealthy and thriving; and in consequence of perpetual grants (leas) of different portions of land from Mr Drummond the proprietor, have expended several hundred pounds in building; and improvements upon their respective properties. The village is now extending upon a regular plan along the south side of the river.

The

ven, Blairgowrie, Coupar, Longforgan, are in the same predicament, besides others.

Allowing therefore that there may be a decrease of population on some of the farms, the increased population of the towns and villages does a great deal more than overbalance that decrease. The produce of the soil is more abundant, and land is improved, which yielded little or nothing before; and wherever you produce more food, you will collect more people. No man will venture to assert that a farm of fifty acres in the hands of four tenants, who have each a horse in the plough and their ground mixed in alternate ridges (provincially *runrig*,) will produce the quantity of subsistence, which on the same farm can be raised, in the hands of one man, who has both money and industry to cultivate the ground with judgment. With respect to population, where is the difference, whether the other three farmers

D d d

live

where it comprehends a tract of about 40 acres, and is beginning to stretch out along the moor of Dalginrofs, formerly a barren plain containing upwards of 100 acres of poor gravel covered with short heath; upon part of which, in August 1797, I had the pleasure to see, the second crop of clover more than a foot high. As a natural consequence of this progress, the intrinsic value both of the ground feued and of the ground in the immediate vicinity let in tack by small allotments to the villagers has increased in value, and about 100 acres of waste land have been brought into a state of good cultivation. Such are the invaluable advantages of judicious industry and steady exertion.

The same industry is displayed at the Ross, a new village, adjacent to Comrie, lately set off by Mr Drummond of Strageth. This gentleman gives feus of four acres, in some cases, to his villagers, besides some acres more in lease, which renders the people very comfortable. The houses are substantially built and covered with blue slate.

Most of the villages in this county are feus in perpetuity. Others are long leases; which saves the expence of charters and seizures.

live on the farm or in an adjoining village? but with respect to industry, the difference is great: On the farm, they were three fourths of the year idle and in want; in the village they become skilful artists, and are able to rear their families without penury, to educate them decently, and to breed them to some useful employment.

The population is not only increased and the land rendered more productive, by the establishment of well-regulated villages; but labourers are at hand in the time of need, and artificers of various denominations, all ready to be employed in ministering to the different wants of the neighbourhood. Villages also afford a ready market for whatever the farmer has to sell, and supply him with dung to improve his possession.

In writing the Agricultural Report of the southern districts of this county about two years ago, I referred to the Statistical Account of the different parishes as the most authentic evidence, which could be had, of the state of population: and having examined that publication with some care, relative to this subject, the following table is drawn up, which lays the population of the county before the reader, with all the accuracy the thing can admit of. The population of the parishes, of which no account has hitherto been published, is estimated at an average of the rest of the county; which is probably not far from the truth.

STATISTICAL

POPULATION.

391

STATISTICAL TABLE OF PERTHSHIRE.

<i>Names of Parishes.</i>	<i>Popula- tion in 1755.</i>	<i>Popula- tion in 1795.</i>	<i>Names of Parishes.</i>	<i>Popula- tion in 1755.</i>	<i>Popula- tion in 1795.</i>
Aberdalgie, - -	320	522	Kenmore, - - -	3065	3462
Abernethy, - -	1420	1415	Killin, - - - -	1968	2360
Aberfoil, - - -	895	790	Kilspindie, - - -	828	712
Alyth, - - - -	2680	2723	Kincardine, - -	1250	2068
Arngosk, - - -	736	554	Kinfauns, - - -	659	518
Auchtergaven, -	1677	1784	Kinloch, - - - -	331	374
Auchterarder, -	1194	1670	Kinoul, - - - -	1163	1465
Balquhidder, - -	1592	1300	Kippen, - - - -	1799	1777
Blackford, - - -	1681	1360	Leacroft, - - - -	577	420
Blair Athol, - -	3257	3120	Lethendy, - - -	346	367
Blairgowrie, - -	1596	1651	Logie, - - - - -	1985	1500
Callander, - - -	1750	2100	Logierait, - - -	2487	2200
Caputh, - - - -	2048	2045	Meikle, - - - - -	1000	1148
Cargil, - - - -	1897	1720	Methven, - - - -	1790	1786
Cluny, - - - - -	905	1037	Monydie, - - - -	1492	1320
Comrie, - - - -	2546	3000	Monzie, - - - - -	1192	1136
Coupar Angus, -	1491	2076	Monivaird, - - -	1460	1025
Crieff, - - - - -	1414	2640	Moulin, - - - - -	2109	1749
Culrofs, - - - -	1695	1442	Muckart, - - - -	535	526
Dron, - - - - -	598	450	Muthil, - - - - -	2902	2948
Dull, - - - - -	4897	4676	Perth, - - - - -	9019	19,871
Dunbarny, - - -	764	1250	Port Monteath, -	1865	1765
Dunblane, - - -	2728	2750	Ratray, - - - - -	751	500
Little Dunkeld, -	2919	2705	Redgorton, - - -	1074	2123
Errol, - - - - -	2229	2683	Rhynd, - - - - -	498	495
Forgandenny, - -	1295	978	St Madoes, - - -	189	300
Portingal, - - -	3859	3914	Scone, - - - - -	888	1442
Foulis Wester, -	1706	1224	Gibbermuir, - - -	988	1280
Gask, - - - - -		486	Trinity Gask, - -	913	795
Glendevon, - - -	220	240	Tullyallan, - - -	1321	2430
Inchture, - - - -	893	1000	Weem, - - - - -	1295	1364
Sum,	52,902	55,307	Sum,	47,719	61,451

By the returns made to Sir John Sinclair from the ministers of the sixty-two parishes mentioned in the table, the population of these parishes in 1795 and perhaps for two or three years before that period, according to the time the returns were made, amounted to 116785. But there are fourteen parishes unaccounted for, viz. Kilmadock, Kincla-

ven, Kinnaird, Kirkmichael, Langforgan, Maderty, St Martin's, Bendochy, Colace, Dunkeld, Dunning, Forteviot, Foffway, and Foulds Easter. Four of these have considerable market towns, and others are populous landward parishes. Therefore their present population and increase may be above the average of the rest of the county. Taking however the average of this number for these fourteen parishes, their population may be stated at 26365.—The whole population of the county is 143,123. The increase on sixty-two in the last 40 years is 16137; and allowing the average of this increase to the fourteen unaccounted for, the total *increase* of the population of Perthshire from the year 1755 to 1790—5, is 19781.

CHAP. XVI.

OBSTACLES TO IMPROVEMENT.

THE obstacles to improvement are many. Some of them may with ease be removed; others with more difficulty. Some arise from the situation of the land; others from the habits of the tenantry; and not a few may be ascribed to the proprietors themselves.

1. *Townships.* A number of plough-gates in one village, or several tenants about one plough, having their land mixed with one another, is a great bar to the improvement of any country. These townships are removed in counties, where improvements have for some time been established, and where cultivation has made some progress. In many districts of this county, there is no such thing to be seen. In some districts they still remain; and the blame is to be ascribed to the landlord. Wherever a stranger sees four or

six or eight ploughs of land, possessed perhaps by double that number of tenants, and perhaps a cottager or two annexed to each plough, all huddled together in one village, he instantly judges that the proprietor is destitute of understanding to discern his own interest or that of his people; and that the people are destitute of energy, strangers to industry and to the comforts of life.

However necessary these hamlets were, for the mutual aid of the inhabitants, in rude ages and unsettled times, when the safety of a man's person, the protection of his property and the defence of his family, depended more on the affection and prompt assistance of his neighbours, than on the arm of the civil magistrate; yet in the happy days in which we live, such clusters of houses are no longer necessary. Every man sits securely under his own roof; and none dares to make him afraid.

2. *Runrig*. This is a species of the former evil upon a smaller scale; and it was fostered by the feudal ideas. In these times, He that could muster the greatest number of retainers, generally made to himself the greatest estate. But in our times, nothing can be more absurd, than to see two or three, or perhaps four men, yoking their horses together in one plough, and having their ridges alternately in the same field, with a bank of unploughed land between them, by way of boundary. These diminutive possessions were carried to such a length, that in some parts of Scotland, beyond this county, the term *a kerses' foat** of land is not wholly laid aside. The land is like a piece of striped cloth, with banks full of weeds and ridges of corn, in constant succession, from one end of a field to the other. Under
such

* The sixteenth part of a plough-gate.

such management, all these people must have concurred in one opinion with regard to the time and manner of ploughing every field, the kind of grain to be sown, and the season and weather fit for sowing, and whether they and their horses were to be employed or idle. Even so late as thirty or forty years ago, this practice prevailed, not only over the greater part of the county of Perth, but with very few exceptions over all Scotland. Since that period, it has been gradually going into disuetude; and the benefit of laying it aside entirely is so apparent, that any remains of runrig, which are still to be seen, must soon disappear, except where the landlord is as much a Goth as his tenants.

Considering the various avocations, which these tenants must have, and the frequent jarring animosities, which will necessarily arise in a close neighbourhood, where opposite interests are constantly interfering, it is impossible to expect, that under this system, any species of improvement can go on. Townships and runrig are such obstacles to improvement, and bolt the door so firmly against all cultivation, that it cannot have the least entrance; and they hold the people in the chains of idleness and poverty, wherever they prevail.

Were every farmer to have his land set off by itself, let it be great or small; and were his ground inclosed; he might improve, if he is inclined to be industrious, without being fettered by his neighbour's humour or ignorance or indolence: and if he is not inclined to work, his farm stands out a spectacle to the whole country, an evidence of his sloth; in so much, that if the admonitions of his landlord, the example of his neighbours, his own interest and a regard for his family, have no effect in rousing him to be industrious,

dustrious, he marks himself, as it were with his own hand, as a fit person to be set a drift, at the end of his lease.

3. *Boundaries of estates.* In some instances the boundaries betwixt coterminous proprietors are not streighted, even in the arable land: In many cases these are not settled at all or ascertained in the moors.

Uncertainty with regard to the limits of farms or estates is a constant source of altercation among tenants, and frequently the cause of expensive litigation between gentlemen. The damages, awarded by the law for trespasses, being daily exacted are like oil poured on the fire of discord, which keeps it continually blazing in a flame. In every situation of this kind, it is evident that both proprietors and tenants must suffer in their interest and in their peace; and that the land can neither be inclosed or improved.

4. *Servitudes.* Any thing demanded under the name of rent, except money, or perhaps part of the produce of the farm, is an obstacle to improvement. If the landlord's house be distant from fuel, and the carriages of his own horses unable to supply him in that necessary domestic article, it hardly can be expected that the carriage of fuel by tenants is altogether to be laid aside. But the ploughing or harrowing of land, the mowing of hay, the cutting down of corn, or any other services, which divert the strength of a farm from its own labour, are of the worst consequence to agriculture. The spirits of the people are sunk, and their vigour enervated by these bondages. If they have any sensibility, or if they look around them in the world, they feel the weight of the burden; and it gives an edge to their resentment, that they cannot conveniently shake it off. They perceive that they are slaves and cannot better their condition; which is the lowest depression of human nature.

Wherever

Wherever the country is improved, very few servitudes are imposed, and nothing exacted, except a money rent. The farmer feels himself independent, in possession of his lease, when his rent is paid; which soothes his cares and gives a spring to all the active powers of his mind.—The payment of grain to the landlord may be of use to keep the prices moderate, and to prevent exportation at improper times, when landlords are well disposed towards the public good; yet the payment of grain, which at one time was very prevalent, occasions endless disputes betwixt parties, where uninterrupted harmony is equally the interest of both, and harasses the landlord with all the drudgery of a meal-monger, and of a corn-merchant.

5. *Thirlage*. Thirlage is a grievous bondage; and its pernicious influence on the improvement of the country is severely felt, in every place where it prevails. At some mills, the multure is five lippies out of every sixteen pecks of grain, which is nearly a thirteenth part of the whole; at other mills, it is six lippies out of seventeen pecks, which is a twelfth part of the restricted grain; and at one mill it is the tenth part.—This servitude was no doubt introduced originally, as a compensation for building and upholding a mill, and for paying the wages of a miller: and we can suppose a stage of society, in which the culture of the land was so wretched, that the price was no more than enough; but these circumstances no longer exist, and it is to be hoped, shall never again return in this country. At every mill, the present amount of the thirlage is by far more than an adequate value for the labour, to which it is supposed to be the price. It is an odious tax, because it is in every sense a tax upon industry. The slover in all cases pays less than the impro-

improver *. It is therefore not only unwise, but unjust. Its principle is wrong; its aspect is oppressive and cruel; and the manner and degree, in which it is often exacted, are no better. It is diametrically contrary to the genius of the British constitution, and hostile to the prosperity of the country at large. Since the first copy of this report, published in 1794, has been in the hands of the public, the zeal that has appeared in different counties to shake off the yoke of thirlage is very laudable, and every man, who desires to see the improvement and the prosperity of the country continuing to be progressive, must with them perseverance and success.

Instances are not wanting in this county, in which proprietors lay out their lands in grass, to escape a heavy multure, which they are unwilling their tenants should be subjected to pay; and skilful farmers are obliged to depart from the rotation, which their good sense dictates to them, in order to avoid this heavy tax on certain grains; and there are also instances, in which multure is paid for grain, without having the benefit of a mill to grind it.

Where the mill and the lands bound to it, belonged to one proprietor, thirlage has in many places been long ago abolished; which, of itself, is a proof that it was accounted a grievance. The greatest difficulty arises, where the mill belongs to one proprietor and theucken † to another; as in the cases mentioned; which makes the interference of the legislature necessary.

But one will say, are the proprietors of mills to lose the rent of their mills? By no means. Let the value of the

E e e multure

* How applicable this to the payment of tithes in England.

Mr William Dann of Gillingham.

† The district bound to a mill.

multure be ascertained according to the average of three or five years of the produce of the aftricted lands, by proper arbiters : Let this value or price be levied from the whole fucken, either annually ; or at once, at fo many years purchafe, as the legiflature fhall deem reafonable. This is the rule adopted with regard to the purchafe of tiends (tythes) in Scotland. Every land-holder may buy up the tiends affecting his eftate at a fpecific price from the titular, who now holds them, which the titular is bound by law to accept of.

If the farmers in the neighbourhood choofe afterwards to refort to the fame mill ; let fuch a compenfation in grain or in money be given to the miller for his trouble, as may be agreed on. And fince the origin of multure was an allowance for keeping the mill in good order ; even after the multure is bought up and thirlage abolifhed, the proprietor of a mill ought to be bound to keep it ftill in good order, becaufe the thirlage having been only commuted, the price for his doing fo has been paid to him. This obligation makes the bargain fair on both fides ; without which the fucken receives not full value for the money, to be paid to the proprietors of mills.

In order to get employment, the miller will, under this new regulation, think it his intereft to treat his customers with difcretion, and to perform their work readily, fkilfully, and honeftly ; whereas by the prefent rule, his humour rather than a fense of duty regulates his conduct. He does not confider himfelf to be the *fervant*, but the mafter of his customers, well knowing that the yoke of thralldom is wreathed by the exifting law fo firmly about their necks, that they dare not pafs his door.

6. *Shortness of Leases.* The shortness of leases, in some cases, and in others, there being no leases at all, sinks the spirit and ties up the hands of the husbandman from improving his farm. No man will labour willingly, for any length of time, to promote the emolument of another person, in whom he has no interest. If a farm be capable of no improvement, there is surely the less hurt arising from an uncertain tenure; but farms in this predicament are very rare; and scarcely can any place be pointed out, to which nature has been so unkind, that nothing can be done to meliorate its condition.

The same term of years may not suit the leases in every country. In grass farms, no doubt, there is least to be done; but where there is command of water from the hills, and land on the surface of these hills which may and ought to be made green; where there is brush-wood to be grubbed out; where meadows are to be cleared of superfluous water; where the land is open, and no inclosures made between the hill and the green pasture; where stones are to be blown and little patches of arable land to be divided into small closes, What tenant, in his senses, will be at the expence of these improvements, without a lease, or even on a lease of nine years? Were he so foolish as to lay out his money upon these conditions, he knows that he would, in every step of his progress, be acting against his own interest; for, very probably, by the time that these improvements were finished, his lease is expired; another man makes interest with the proprietor, steps in before him, wishing to reap the fruit of his improvements, and gets him turned out of his farm. The least evil that could befall such a man, would be, to pay more rent for the very improvements which he had made, at his own expence, with-

out being reimbursed : By which means he is both the price and the purchase out of pocket.

If all this may befall an industrious man, on a grass farm, how much more so on a possession which is arable. There an uncertain tenure cuts the very sinues of industry. In grain-farms, not only are surface-improvements necessary, as in the former case, but the body of the soil must be meliorated before it can be rendered productive. On such farms I have uniformly found the leases to be longer ; but even some of these are too short, to encourage an industrious man, who has much to do, to exert himself in improving his farm, with any probability of drawing back his money before the end of his lease.

The propriety of imposing a progressive rent has been suggested, in treating of rents, page 77 ; and this rise ought to be regulated by the probable state of the ground, on a fair estimate of its melioration, and by the price of the commodities on the sale of which the payment of the rent depends, at the several periods, in which the rise of rent is to take place ; leaving it in the option of the tenant at every period or breach to relinquish or abide by his possession, as he finds this estimate corresponding to, or falling below the situation of the times. When breaches of a lease are adopted, the option is generally on the other side ; which is the next thing to no lease at all, and operates immediately against the farm and ultimately against the proprietor.

A wise and humane landlord suits the duration of his leases to the state of his *lands* and to the *industry* of the tenantry : Allowing the industrious man a reasonable time to indemnify himself, for the expence of his own improvements, before the expiration of his contract. Perhaps he ought to make distinctions amongst his tenants,—not a distinction arising from

from the flattery or fawning or other low arts which individuals amongst them may employ as engines to work upon his vanity, nor a distinction made by influence they may bring upon him, from persons who possess his ear, in order to shake his steadiness; but a distinction regulated uniformly by the industry and integrity and the other qualities, which distinguish a good farmer and mark his character as meriting the countenance of his landlord, and the esteem of the public.

Were the farmers on an estate, who thus distinguish themselves from the common herd of tenants, to be rewarded with leases of an endurance, double to the common term of years adopted for the generality of the property, this would be such a powerful stimulus to their neighbours as would excite them to emulation, and be productive of the best consequences to themselves, to the proprietors, and to the community. This system requires acute discernment, profound prudence, and inflexible impartiality, to ensure success; but where these are united, and are aided by perseverance, they will infallibly produce the desired effect. Every method ought to be tried to rouse the farmers to activity: but without encouragement, they will not, they cannot be roused. Without encouragement languor seizes their minds, their spirit is fled, and deadness enervates their active powers.

In many districts of this county the farmers deserve to be encouraged; and in some instances of almost every district, certain individuals aspire to distinguish themselves. Why ought not this boon be held out to animate their exertions? They ought to be cherished, for their own sake, and for the sake of the commonwealth. They are the pillars of the state. On them rest the fabric of our prosperity. Our
commerce

commerce may be crippled. Our manufactures may decay; but our improved soil is a permanent treasure, which spreads its riches among all classes of men, from the highest to the lowest orders of society.

A traveller, who makes even a transient excursion through this or any other county, can be at no loss to understand from the appearance of different estates, where the landlords give encouragement to their tenants, and where the tenants avail themselves of this encouragement; neither I, nor any other person needs to point them out; they point out themselves. For no demonstration in mathematics follows with more certainty from the premises, than that a neglected soil is demonstrative of something highly shameful in the persons who possess it; and that an improved soil is an evidence of the good sense of the landlord, and of the spirited industry of the tenants.

7. *Distance from Manure.* The distance in some parts of the county from lime and other stimulating manures is an obstacle to improvement, which cannot easily be removed*. This inconvenience is owing to the local situation of different places: but the other obstructions are entirely occasioned by men, who neither study their own interest, nor that of their country.

There is, however, such an abundant quantity of marle, near those places which are most remote from lime, and some of these treasures still unopened, that if the one be distant, the other is at hand. When the roads are improved, of which there is so near a prospect, from our two principal

* But if stimulating manures be used in small quantities, at top-dressing, which is the safest and best method, good middling crops may be obtained at a moderate expence. *Sir William Murray of Auchtertyre.*

principal lime-markets, into the heart of the country, the journey will be more easy and the horses thereby enabled to carry a greater load : And if any method shall be devised on an economical plan, of pounding raw lime stone for the use of the more inland districts, this additional manure will compensate the want of calcined lime.

8. *Commons.* The most noted commons in the county of Perth, have been already pointed out in the chapter upon wastes. Olegirt moor, near the bridge of Teath, has been divided and mostly inclosed, since the survey of 1793 has been in the hands of the public. The moor of Culrofs, which consists of eighty or one hundred acres, is not divided, and no plan of division adopted. There is another common near Muckart, at the south entrance of Glendevon, which is called Common Edge, and consists of 700 or 800 acres, on which the farms of that place have a joint right of pasturage. But as it is too valuable to be planted, and too high to be made arable, and the expence of inclosing every separate share is saved to a number of small feuars, who are the proprietors, the prospect of its being divided is distant and not very necessary*.

Some other hindrances to the improvement of the country might be pointed out ; such as loose and vague contracts betwixt landlord and tenant, which is a source of frequent and vexatious litigation : A desire which some proprietors cherish of keeping their tenants in constant dependence :

An

* In this list of obstacles to improvement, the payment of tithe is not noticed. *Query.* Is the county of Perth tithe-free, or does the author think tithe no impediment to the improvement of poor waste lands ? *aliquis Ignotus.* *Ans.* The exaction of tithe in kind is certainly an impediment, but it could not with propriety be included in the survey of any county in Scotland, because there is no tithe payable in the same manner as in England.

An undue advantage, which some tenants are watching, to take of any inadvertencies of their landlords, which breeds jealousies and leads to rooted aversion : Racked rents, which not only disable the tenant to improve, but urge him on the contrary to scourge the ground annually, to enable him to keep his day of payment : Forgetfulness of promises on either side, which begets distrust : The rooted aversion of some among the tenantry to follow new modes of culture, which they account unmeaning innovations : The poverty of others, which cripples their operations : The use of clumsy and cheap implements of husbandry, which retards labour, and renders it unworkman-like, after it is performed : Employing horses unfit for the work, and in some cases too few, in others too many : Neglect of the proper season of sowing, reaping, or ingathering : A bad selection of stock in sheep or in cattle : Want of care in choosing proper feed. These, and other obstacles, have been occasionally animadverted upon, in the preceding part of this report ; therefore it is not necessary to resume the discussion of them in this place.

CHAP. XVII.

MISCELLANEOUS OBSERVATIONS.

SECT. I. *Societies.*

THERE was a society for the improvement of agriculture at Dumblane, at a very early period of this century, which continued to flourish for twenty years ; and did much good, while

while it subsisted. At present there is an agricultural society in Strathearn, which meets twice at Perth, and once at Crieff, every year. Most of the gentlemen of that country and some of the most intelligent farmers are members. They distribute rewards for certain kinds of improvement. At Doune there is a small society of gentlemen from that neighbourhood, who meet occasionally to compare notes and to converse together on agricultural subjects. A society for the improvement of agriculture has been established some time ago at Blairgowrie, in the district of the Stomont, composed of some of the most intelligent gentlemen farmers in that country, who have joined a distinguished knowledge in the cultivation of the ground, to eminence in the liberal professions of life*.

SECT. II. *Weights and Measures.*

MUCH confusion hath arisen to the public, much chicane has been used by the artful, much loss sustained by the ignorant, and many law-suits have taken their rise, from the diversity of weights and measures, in different counties, and in different districts of the same county. Many calculations and proposals have been made, and many books have been written on this subject, by men of profound research, and yet the embarrassiment does not seem to be lessened. Without pretending to be any wiser than other people, every person is at liberty, when the public good is concerned, not only to entertain his own opinion, but to propose it with deference and respect. Why have we a predilection for one weight or for one measure, more than for another? There was a time, when none of them existed: when all things

F f f

were

* Upwards of 50 gentlemen and farmers have established a Farming Club at Callander since this report was in the hands of the Board,

were bought and sold by barter : and none of them has more intrinsic excellence than another. The first weight known in this country was a rude stone from the brook, as the name still imports. Let us cut the knot unless we can loose it.

If it is still found to be impossible to agree about establishing some one of the various weights we have, as a standard for the whole nation, and for all commodities which are sold by weight, why may not a committee of the supreme council of the nation take a stone from the brook, and have it enacted that this stone shall be an ounce or a pound weight, according to its size ? If it is called a pound, let sixteen parts of it be so many ounces, and so downwards to other denominations ; and sixteen times the original weight added together be called a stone weight, and so upwards to hundred weights, &c. Perhaps it would be more proper to adopt some known weight and measure, and to abolish all the rest : and although none of them has any claim to a preference, if it shall seem meet to the legislature, I see no good reason, why avoirdupois weight and the Winchester bushel, which at present are very much in use, should not be made the standard.

It is with pleasure, that the public have beheld the ardor, with which some counties have taken up this measure of late ; and there is little doubt, that the good sense, and the desire of promoting fairness and justice between man and man, in some of the most important transactions of life, will induce all counties and burghs, and every community in the kingdom, to join in an application to Parliament to establish this uniformity : and when the pressure of foreign affairs will allow leisure to turn their attention to matters of a minuter nature, relative to internal police, great hopes are entertain-

ed that Parliament will listen to the application, and carry the measure into effect.

The only objections, to which this proposal seems liable, are two. 1st, That it will be difficult thereby to ascertain the value of some of the more precious commodities, which are commonly estimated by small weights. The divisions or fractional parts of the new weight, may be as minute as these of any of the old weights; and in a short time, every person concerned in these will calculate the difference betwixt the former weight and the new standard, so that every commodity from wool to saffron, and from lead to gold, shall come to its proper level, and to its real price. 2dly, That these proprietors who are in use to receive payments from their tenants, vassals, or feuars, in commodities, by different weights, will be puzzled how to ascertain, by the new standard, the exact quantity of these commodities stipulated in their contracts. To remedy this inconvenience, let proportions be fixed betwixt the new standard and the various old weights and measures now in use; let a table of these be published by authority: and by the smallest attention to these proportions, all the difficulties on this subject may be easily overcome, even in the first instance. After a few calculations they will totally disappear. In some such way as that mentioned above, it does not seem to be very difficult to have this matter adjusted; and, under the sanction of the Board of Agriculture, with the concurrence of so many respectable counties, there is little doubt that all difference of opinion may be accommodated, and a measure so evidently calculated for the public good, finally prevail. That it should now misgive, will be no less surprising, than that it has never hitherto been attempted.

SECT. III. *All commodities, which are not liquid, ought to be sold by weight, not by measure.*

THERE is a matter of equal difficulty, and of equal importance with the former, which may naturally come under the consideration of the Board; and it gives pleasure to every well-wisher of his country to see so many counties resolving to apply for a law, ordaining that every commodity, which is not liquid, should be sold by weight alone, and never by measure. This was strenuously recommended in the report, which I had the honour to write in 1793; and I wish still to call the attention of the public to an object of such national utility. In vain shall the Board of Agriculture, or others recommend the sowing of plump heavy grain, and the cultivation of the soil to enable the earth to produce such grain, so long as corn is sold, not according to its real value, but according to its bulk; not according to its weight, but according to measure. At present all kinds of grain are generally sold by measures of capacity alone; but the quality of grain is so various in different provinces, and almost in every different farm, by reason of the thickness of the husk and the smallness of the kernel, that this mode of sale is so extremely fallacious, that the most discerning may be imposed upon. Whereas, if it were enacted that all grain were to be sold by weight only, the imposition upon the lieges would be less frequent, and the farmers more attentive to the quality of their grain.

It is recommended by the Board to take notice, in these reports, of any practice which prevails in one county, that might be profitably introduced into another. May we not also mention what is done by other nations, that ought to be

be adopted in our own. I have the best authority* for saying that the Chinese sell not only their butcher-meat, whether dead or alive, but all their grain, their roots, and every other commodity not liquid, even the very pot herbs they use, not by measure, but by weight. Let us learn a lesson from that ingenious people; and become wiser, by their example.

SECT. IV. *The genius of the people in the county of Perth.*

THE people of this county seem in general to have a spirit for improvement; but it must be acknowledged, that it is greater in some places than in others. The highlands in general are behind most of the districts in the lowland provinces in the knowledge of farming. That country is less adapted to an arable system. The principal attention of the inhabitants is directed more to their cattle and their flocks, than to agriculture. Their intercourse with the best improved parts of the lowlands is less frequent, owing to the difference of their language, the difference of their dress, the difference of their manners and habits of life. The progress of cultivation likewise is naturally westward. The acuteness of the people has nevertheless, in a great measure, surmounted these difficulties; and in many instances their ground is cultivated in the highest style of farming, that can be adapted to their climate and soil. Their genius, like their soil, is more easily stimulated than their neighbours on the east and south.

Over all the county, when the heritors improve upon an economical plan, which the farmers see to be within the reach of their circumstances; when they are at pains to convince

* Robert Fairful, Esq; of Struie, late captain of the *Minerva*, East Indiaman, who was often in China.

vince them, that it is their interest to adopt a new system and the balance is fairly on the side of profit ; when one of their neighbours, a person of the same class with themselves, is making rich by improving his farm ; all these cannot fail to be a powerful incitement to the farmers in the neighbourhood. If the land is inclosed to their hand, and no drudging services exacted ; if additional manure is easily commanded, and good examples every day before their eyes, their emulation will do the rest. The principle of imitation allures them ; their avarice stimulates them ; the cravings of luxury, the love of show, and the desire of the comforts of life, solicit them ; their ambition to be independent kindles their pride ; and their envy itself lends its aid, to rouse them to improve their lands.

Agriculture, however, is a progressive thing ; and its progress depends on a variety of causes. If the people are poor, if they are ignorant, if their farms are too small, if their rent be excessive, if they are oppressed, if proper examples are wanting, if they are deprived of the fruits of their industry by want of leases, illegal exactions or other sinister means, they are neither able nor willing to do justice to their farms nor to themselves. They never will improve.

SECT. V. *Vermin.*

EAGLES frequently carry off lambs in their talons to feed their young, which they hatch in the most inaccessible rocks of the Grampian mountains ; but by the vigilance of the shepherds, they are much reduced in their numbers. The crow is also a foe to sheep, when entangled in briers, and to their young when found straggling from their dams, by reason of weakness or cold. He picks out their eyes and afterwards feeds on the carcase.

Not-

Notwithstanding the economy of nature in restricting all beasts and birds of prey to a small brood in one season, these will certainly increase in this country, owing to the strictness of the law about shooting. Nor is it easy to devise a method, by which shepherds might be allowed to shoot eagles and crows, without suffering them to destroy the game and to elude the tax.

The fox-hunters have regular districts of the country committed to their care, from which they levy annual assessments on the several farms, according to their contract. This plan is capable of being much improved: and it were a wise measure, because it would be more effectual, to make the assessment more moderate; and besides the assessment, to pay each of them a small sum as a reward, for every fox they could kill; and to subject them to a small fine for every sheep or lamb that could be proven to have been killed by a fox, within their district. If this regulation were adopted, which is very much in the power of their employers, it would be a spur to their diligence, beyond any thing that has hitherto been devised.

This is said to be the manner in which wolves were extirpated. Government increased the reward for killing a wolf, in proportion as the species became more rare. Might not foxes be extirpated by the same regulation?

Means of improvement, and the measures calculated for that purpose.

IN such a great extent of territory and in such varieties of soil and climate as this Survey embraces, it is difficult to compress the observations that occur, or to do justice to the remarks which have been suggested by judicious persons in different parts of the county, within the limits which
might

might appear moderate. Brevity is attainable, when the surface is small; when a sameness appears in the features of the various districts and a similarity in all their agricultural operations: But when a diversity prevails, in most of these respects, in the practice and natural situation of the different provinces, brevity is unattainable, without being superficial. A train of reasoning or illustrations might be abridged; but facts it is impossible to abridge.

The improvement of the kingdom being the sole object of the Board, whatever has a tendency to promote the main design ought not to be suppressed; and the very desire of contributing his share to the national prosperity in this view should screen a writer from the charge of being prolix.

Various improvements have been pointed out in the preceding pages of this report. In giving an account especially of the obstructions, that have a natural tendency to retard the progress of agriculture, the means of removing these, which appeared to be most practicable and most effectual, have also been taken notice of.

1. *Emigration.* In order to put a stop to emigration two things seem to be requisite. 1st, To provide food for the people; and 2dly, To find accommodation for them. The quantity of food will no doubt be increased under the auspices of the Board; and it is not improbable that the wisdom of parliament may soon be exercised to devise measures for bringing back to tillage, the vast extent of arable ground, which is at present under grass, and which is daily increasing. If bread be scarce, bread will be dear. When bread is dear, rents will rise with rapidity. This may be a pleasing speculation to some classes of men, unless they look forward and weigh the consequences. But two things must follow. Whenever grass lands that are fit for tillage are taxed,

or some other measure adopted, to subject them again to the plough, grain will become a drug, rents must fall with more rapidity than ever they rose, the farmers will become bankrupt and the landlords must finally suffer in their income. To crown the distress, the labouring class of mankind had been banished by the dearth of bread, during the progress of this ruinous system, and neither are hands found to work the land nor mouths to consume the grain.

Considering the situation of the Highlands of Scotland, and the system that has been pursued there for several years past, unless villages, under wise regulations, be increased in number and in size, and married servants kept on the arable farms, a train of evils must follow: whereas, if maintenance, employment and lodging be provided for the people, their natural attachment to their country and their partiality to their natal soil will constrain them to spend their days where they were born. In the sheep countries, there are many convenient spots, where villages may be established; and the sheep system may prove hurtful to the population, unless this remedy be provided. We have adopted a cantphrase, *That things will find their level*, which in some cases is strained and carried too far. It is true with regard to prices, and was at first introduced under this acceptance; But with regard to population it is most incorrect. John or James may depopulate their farms or their estates and lay all their lands under cattle. If they cannot find a market at home, because they meet with none to purchase, they can drive their cattle two or three hundred miles till they get their price. But can they with equal ease replace the inhabitants, whom they have banished? *Hic labor, hoc opus.*

There is plenty of wool in the Highlands, to employ the people in spinning, plenty of land for potatoes and some grain,

abundance of pasture fitted for producing mutton, to feed all the inhabitants, in aid of their grain, enough of timber to erect houses to lodge them, and inexhaustible funds of moss in different places to be fuel. There is more humanity in rendering mankind happy and comfortable, than in driving them from their native home, to wander they know not where; more pleasure surely in rendering them convenient, than in reducing them to misery; more prudence in keeping artists and labourers at hand, for being employed in providing the various necessaries which the advanced state of the country and the taste of the age require, than in purchasing them at a dear rate and carrying these from afar; and certainly there is more patriotism in contributing to keep the people in their own country, to fight our battles in the time of need, and defend every thing that is dear to Britons, than in chasing away the natural guardians of our privileges and independence, to seek an asylum on a foreign shore. Must Britain be a cruel step-mother to her children? And shall the Highland gentlemen, whose fathers had a pride in the number of their men, shut up their bowels of compassion against the children of those, who fell by their fathers side? Have the anguish and the tears of their kindred, and those of their blood no effect in melting their hearts to the tender feelings of compassion? And is the blessing of him, who is ready to perish, not worthy of being enjoyed? How different was the conduct even of the Heathens to their tenants*!

It is to be hoped that avarice has not swallowed up all the
faculties

* *Lucium Volusium asseverantem audivi, patris familias felicissimum fundum esse, qui colonas indigenas haberet, et tanquam in paterna possessione natus, jam inde a cunabulis longa familiaritate retineret. Colum. l. i. c. 7.*

faculties of their minds nor the tender sympathetic feelings of their hearts. It is to be hoped they still listen to the voice of conscience, to the dictates of humanity and to the authority of religion, and will therefore act towards their tenants, as they would wish to be the case, were they themselves the tenants, and their tenants the proprietors.

This report may not reach these remote corners, where that national distemper rages with increasing virulence; and although it did, the suggestions it contains, which may seem to militate against the emolument of some individuals, have a chance of being disregarded as officious, or branded as the cloudy dreams of a distempered imagination. The voice of truth is sometimes so feeble, that it cannot be heard, until it be too late. But it is the business of Government*, the natural guardians of the state, to watch with a vigilant eye over the national prosperity, to guard against national evils, to foresee danger and to prevent it by salutary regulations, to make its voice to be heard over all the empire, its authority to be regarded in every province and submitted to by the most remote individual.

It is clear as noon-day, that if the present system goes on in certain counties, and if villages are not established in these counties to preserve the population, that recourse must ere long be had, in a certain degree, to mercenary troops for protection; and the history of the world in all ages loudly proclaims woe to that nation, whose defence is entrusted to mercenaries.

2. *Bridewells.* Owing to the defects of our criminal law, by which in a variety of instances, persons are capitally punished for less enormous crimes, than those which others

G g g 2

commit

* See Colonel Robertson of Struan's Letter on this subject in the Appendix, N° 4.

commit with impunity, every possible remedy ought to be devised, to render the punishment adequate to the offence. What comparison is there between stealing a sheep or a cow, for which the thief is hung, and failing fraudulently for the fourth or the half of a million, for which the bankrupt's name is only published in the Gazette. The person against whom the theft was committed, may be in such circumstances as never once to feel the effects of his loss: while a hundred families are reduced to beggary and despair by the bankruptcy of the other. They may have the additional mortification to see him handsomely provided for, out of the ruins of his fortune, while they are without a morsel of bread. The injury to the public is surely in proportion to the loss sustained by the crimes committed. If the law is such, that a bankrupt does not forfeit his life, (for his honour is nothing in his estimation) the public have a right to any effects he left unsquandered away, and also to the labour of his whole life, unless his debts can be paid.

By transportation, persons convicted of crimes relevant to infer only an arbitrary punishment, are restrained indeed from committing any more mal-practices in their native country, but they make no redress to the community for the damage they have already done. The establishment of working-houses in the head-town of every county would do much good in this respect, and in some degree indemnify the public. The expence of transporting felons would be saved, and a recompence made for the trespasses committed, as far as they have it in their power. Crimes would also be less frequent; because solitary confinement and hard labour are more terrible than the gibbet. Two small adjacent counties might join about one Bridewell; and large coun-
ties

ties might have separate establishments. The Dunblane district of Perthshire might very properly be united to the county of Stirling.

The licentiousness of these times requires vigour in the execution of the law; and the civil magistrate ought to be strenuously supported in the discharge of his office. Licentious principles uniformly beget licentious practices. When the understanding is depraved, the heart will soon be contaminated; and when this is the case, society is in danger of being torn up by the root, and the wildest anarchy to deluge the land. In vain do we improve the soil, if the people return to barbarism. With such awful examples of the depravity of mankind around, let us guard against the contagion: let every good subject strengthen the police, and think himself bound to contribute his mite to preserve order and support measures, which are essential to the welfare of his country.

3. *Improvements adapted to the Highlands.* The principles of improvement applicable not only to the highlands of this county, but to the Highlands of Scotland in general, are essentially different in various respects, from these, which ought to be applied to the low lands: and the judgment of the proprietors will no doubt be employed in studying the nature of the country, the temperature of the climate, the genius of their people, and the local situation of their respective estates.

Mr Marshal has in the paper which he gave in to the Board in 1793, pointed out the peculiar improvements of the Highlands in such a masterly and impartial manner, that it merits the closest attention, and shall be taken down here almost in his own words, and altogether in his own sentiments.

1. Increase the industry of the people, by teaching them
how

how to make the most of their land, and by encouraging them to pursue their own interest on rational principles.

2. Permit the present inhabitants to remain; and endeavour to persuade them that it is their interest to assist in the improvement of the country.

3. Use every mean of supplying by industry the natural defects of the climate.

4. Reclaim the soil from its present state of rudeness and endeavour to render every part productive, by a judicious application of the culture, suited to its peculiar circumstances.

5. Adapt the productions, whether animal or vegetable, to the soil, to the climate, to the number and to the necessities (or if you will to the comfort) of the people, and also to the emolument of the proprietors; without which no country can be improved. He explains each of these heads.

1. The great difficulty of introducing improvements in agriculture among men prejudiced in favour of ancient practices, is that of setting them examples, in such a way, as to convince them, that certain profit accrues, to *men of their own class*, from the alteration. The improvements of men of fortune, though ever so great and evident, are passed over as matters, in which they have no concern.

Upon the *large* Highland estates, which are divided into officinaries, or upon any estate of *less* extent, make choice of a ground officer for the former, and of the most intelligent person among the tenants for the latter. No matter who is chosen, nor where he is found, nor what reasonable encouragement he may require, provided he has the ability and the inclination to set the requisite example before his neighbours. Set out a farm for him in the centre of his district, suitable to the nature of the improvements to be introduced;

duced; and whatever new is to be tried, furnish him with the means of executing the design. If an improvement in the breed of stock, provide him with a male, and perhaps with females, of the best quality. If a new species or variety of crop, a new implement, or operation be thought fit to be tried, confide the trial to him: and if it succeed, let him show the result to his neighbours and instruct them, if desired, in the due culture, performance or use of it. Thus from the centre of each district in any estate, the rays of improvement would expand through the whole; an emulation among the tenants would give each attempt a fair opportunity of success; and by their joint efforts, even the largest estate might be rapidly improved.

2. The question, which has been agitated, whether the Highlands should be inhabited by the *human race* or by *sheep*, can have no sufficient ground, until the country be rendered fully productive and fit for the support of either. At present, no part is fully improved; and many places are in the same state of wildness, in which nature has left them: and certainly the proper time of retrieving them from a state so disgraceful to a civilized nation, is while there are *people in the Highlands*: for should they once be depopulated, it might be found difficult to re-people them. The present race of inhabitants, like all others, have an extraordinary attachment to their *native* soil, and by their habits of life, they are fitted for their situation; but these are habits which cannot soon be acquired, and attachments which cannot be easily formed by strangers, whom it may be found difficult to induce, without excessive encouragement, to take up their abode hereafter in a depopulated, neglected, mountainous country. Hence to depopulate that country, in its present state, would not only be cruel, but impolitic.

3. The

3. The natural defects of the climate of the Highlands are, the severity of winter, the backwardness of spring, and the lateness of harvest.

Soften the rigour of winter, by sheltering the lower farms with screen-plantations, and by dividing them into small inclosures with well trained hedges. Protect the wintering grounds of the sheep farms, by similar plantations; raising furze, broom, juniper or other ever-green shrubs, within the shelter of those plantations; and keep the more exposed parts of the wintering grounds in a full bite of herbage, previous to the approach of winter.

The same precautions will tend to guard against the backwardness of spring; which, on arable farms, and by the help of modern husbandry, might be in a great measure counteracted. On these farms cultivate the early grasses and leguminous plants. By turnips, rape, cabbages, and potatoes, the severities of winter and the backwardness of spring would be equally guarded against: as the lateness of harvest might, by keeping the land in a high state of cultivation; thus preparing it for early sowing, by which the disadvantage might be lessened or the evil removed.

The intrinsic quality of the soil in the vallies is almost invariably good. The improvements requisite are freeing the surface from obstructions and the soil from too much moisture, in particular places. The stones which have in former ages, been gathered off the land, to remove its ruggedness and enable the plough to enter, are in many instances thrown together in heaps, without regard to the form or regularity of the plots thus cleared.

It is not meant that the rugged surfaces of the Highland vallies ought to be, or can be cleared and levelled in such a manner as to render it practicable, in all cases, to lay them

out

out in large square inclosures or with regular straight fences. But were the operations of fencing and under-draining to be carried on, with those of clearing obstructions from the surface, it is evident that the present fields might be greatly enlarged, and their out-lines rendered infinitely more regular and better adapted to the purposes of tillage or hay or pasture.

5. While the country underwent the work of reclaim, the requisite productions would be in a great measure drawn from the soil. It may nevertheless be right to consider, whether in the end, the Highlands, like the Cheviot-hills, should be wholly sheep-pasture. The Highlands and the Cheviot-hills are very different productions of nature. The Cheviots are a congeries of tall hillocks, without regular vallies and with little or no bottom-lands between them. The Highlands, on the contrary, are formed of long ridges of mountains intersected by extended vallies, and some of them of considerable width, which contain lands, well fitted by soil and situation for arable ground, of the first quality: and even supposing a general plan of sheep-farming to be practicable, it would be perhaps a more profitable mode of occupation, to keep some of these lands under a course of cultivation.

Nevertheless let us examine the propriety and even the practicability of converting the entire Highlands of Scotland into sheep farms. Where could be found a market for such myriads of sheep, as the whole Highlands would produce? Hitherto the demand has been greater than the produce; and must continue so, *until the country be stocked*. Young sheep now travel northward from the central Highlands and from the south of Scotland; but whenever the rage of stocking ceases, (though it may happen before the High-

H h h

lands

lands be completely stocked,) sheep of every age will, in the ordinary course of things, return in millions; and by overflowing the central and southern markets will produce such a glut as to create a stagnation of sale: and therefore, unless some new market could be opened in England (which may or may not be the case) the Highlands would be under the necessity of returning to the corn and cattle system, or, for want of inhabitants to carry it on, would lie waste until a new race of natives could be reared, or a new people introduced.

On the other hand, the joint productions of *corn*, *cattle* and *sheep*, appear most likely to give permanency and certainty to the prosperity of the country; the proportion of each being regulated by local circumstances.

It remains to be considered, how far, in the present situation of things, sheep-farming is admissible into the Highlands, and what is the description of land which ought to be appropriated to that system.

The culturable parts of the vallies are best adapted for cattle and corn; the hills for the summer pasture of sheep, which however require the shelter of the vallies in winter. The hills are also valuable for rearing young cattle in the summer season. Again, the brea-faces, or fleeps on the sides of the vallies, are better fitted for sheep than cattle whose tread not only destroys the herbage, but by breaking the soil, renders it more liable to be washed away by heavy rains. The swells within these slopes of the vallies are not so readily buried under snow, and when slightly covered by it, are more easily laid bare by the scraping of the sheep, than level surfaces; and therefore appear to be singularly adapted, as wintering grounds for that species of stock*.

Hence

* Nature seems to have intended the hills for the summer pasture

of

Hence we may fairly conclude, that as many young cattle as are bred in the vallies, should be on the hills in summer; and that so much of the hill-pasture, as is not required for them, should be stocked with sheep, which, in their turn, ought to be allowed as much of the glenheads, breas, and foot of the hills, as will support them during the severity of the winter and spring months: thus rendering the hills and the vallies, as perhaps they ever ought to be, serviceable to each other. In the narrow glens, and at the extremity of all glens, the extent of culturable surface is small in proportion to the breas and hill-lands; for that reason, in such places, the proportion of sheep should be greater, that of cattle less; but in the straths, and on the broad margin of lakes, where plenty of provender can be raised, the system ought to be reversed; and cattle ought to be more, the sheep less numerous.

By thus adapting the productions to the circumstances of the country, and by laying out estates in such a manner, as to keep the different species, as well as the individual farms, distinct from each other, every tenant would be kept to his own particular employment, and be the more enabled to do justice to the charge he may have undertaken. (P. 51 &c.)

H h h 2

4. *Fiars*

of sheep, by reason of the fineness of the grass which grows generally there, and the foot of the hills for their winter feeding by reason of the coarseness of the grass found in such situations, owing to the softness of the ground. *Mr Buchanan of Strathyre.*

4. *Fiars* of the county of Perth from 1780 to 1796. Extracted from the county records by Mr James Paton; and the prices stated in Scots money per boll, which is to Sterling money in the proportion of 1 to 12.

Crops & years.	Wheat, beft fort.	Wheat, 2d. fort.	Wheat, beft fort.	Wheat, 2d. fort.	Oats, beft fort.	Oats, 2d. fort.	Peafe.	Rye.	Meal by weight	Meal by measure.
	L. s.	L. s.	L. s.	L. s.	L. s.	L. s.	L. s.	L. s.	L. s.	L. s.
1780	12 —	11 8	6 18	6 6	6 6	5 14	6 —	6 —	8 —	8 12
1781	12 —	11 2	6 18	6 6	6 18	6 —	6 —	6 —	7 10	7 —
1782	14 14	13 4	11 14	10 16	8 2	7 4	11 8	11 —	11 4	12 —
1783	12 —	11 2	10 4	9 —	9 —	7 16	8 8	8 2	9 12	10 —
1784	12 6	10 16	9 12	8 8	7 16	6 18	7 10	7 16	8 16	9 6
1785	12 3	11 2	9 —	8 —	7 4	6 —	6 12	6 12	8 8	9 —
1786	11 14	11 2	9 6	8 8	8 5	7 1	8 8	8 8	9 3	9 6
1787	12 12	11 14	8 8	7 10	7 16	6 18	6 12	7 16	8 8	8 18
1788	12 18	12 —	7 4	6 —	6 9	5 8	5 8	5 8	6 18	6 12
1789	14 8	12 1	9 12	8 8	8 2	6 6	7 4	7 4	8 8	8 14
1790	13 13	12 15	9 —	8 —	7 16	6 9	7 4	7 4	8 16	9 2
1791	12 12	11 14	10 12	9 8	8 8	7 4	7 10	7 10	9 —	9 6
1792	12 12	11 14	11 8	10 13	7 16	6 6	9 —	9 —	10 8	10 16
1793	14 8	13 10	9 12	8 14	8 17	7 19	8 —	8 —	9 12	10 —
1794	15 —	14 2	12 12	11 8	9 12	8 2	9 18	9 12	9 12	10 —
1795	28 19	27 —	13 10	12 14	10 16	8 8	11 8	11 8	13 12	14 2
1796	14 14	13 4	12 —	10 16	9 6	8 24	9 —	9 —	9 18	10 6

The fiars of this county are settled annually, in the same manner as in other counties, by a jury of traders in grain. This mode of striking the fiars, (as it is called), seems to be improper, because the persons examined as to the prices of grain, may all have an interest preponderating one way, being themselves dealers in the article, of which they fix the price; whereas were only one third of that jury corn-merchants, another third actual farming gentlemen, and the other third farmers who pay 100l. or upwards of yearly rent, every class of the community would be represented in these meetings, every interest would be attended to, and every objection stated and considered: so that there was every chance,

chance, that the judgment given, would rest on the broad basis of the general good of the whole county. The sheriff should continue as at present to be chairman of the jury, be umpire in case of equality of votes, and have the power of judging of any objection that may be brought forward against any of the members as a dealer in grain, which might disqualify him for holding a seat at the meeting. The time of settling these average-prices seems also to be capable of improvement. Candlemas is too early: because a small proportion only is by that time brought to market, and even that small part of the crop which is thrashed out and brought forward is necessarily green and under value. A fair estimate can hardly be made of any crop before the end of March or perhaps Whitsunday.

Decisions are given frequently in courts of law, respecting the prices of grain, many contracts are entered into, and much meal and corn is sold, with a reference to the fairs: and there can hardly be a retrospective rule of equal publicity or of equal authority devised, or more proper for regulating these transactions; therefore too much circumspection cannot be used in the mode of establishing them, as the medium prices of every kind of grain for the respective years to which they refer.

5. *Thorns and Trees to Tenants.* When a tenant wants thorns for inclosing his farm, it would be proper, that they were furnished by the proprietor. For this purpose, a small patch of ground, adjoining to every gentleman's garden, or in some convenient place near his mansion, might be kept for nursing thorns, and timber-plants, under the inspection of his gardener. In order that the good intention of the proprietor might not be frustrated, the tenant should grant a receipt for the thorns, specifying their value, and become bound

bound to refund the price, if the hedge be neglected; but if the hedge is reared into a proper fence, no price should be exacted. Or perhaps it would be more proper, that the heritor, if there be much to do, should be at the whole expence of the fence in the first instance, and that the hedge should be afterwards reared and maintained at the mutual expence of landlord and tenant. This is likely to be the most effectual way of preserving fences in good order, whether they be thorns or stone walls.

In addition to this scheme, if the proprietor were also to have a nursery of forest trees, suitable to the different soils of his estate, and most useful for making the implements of husbandry and the houses of his tenants, they might be allowed (leave being asked and given) to cut down a tree, at the sight of the forrester or ground officer, which was necessary for their purposes, upon planting a certain number along the fences or in other proper places, having them always under their care and at their risk, till out of the reach of cattle; but if the plants were destroyed, the tenants to be bound to pay the full value of the tree or trees cut, and of the plants destroyed.

The landlord in this manner could provide plants at little expence, the tenants would get timber without paying for it; and in a short time, the estate would be furnished with wood of different kinds, so far as it was thought proper. The complaints against the nakedness of our country would be silenced, and our climate would be rendered as temperate, as it was possible for planting to accomplish.—The chance of the failure both of thorns and trees would be less, when taken from a nursery near the place where they are to stand, than when they are brought at a distance, from the warm nurseries and the rich soil, contiguous to great towns.

6. *Inconvenience to Farmers.*—Farmers are exposed by the existing corn laws, to one inconvenience, peculiar to their profession, which affects not the business of any other class of men. Every manufacturer, every tradesman, every vender of the produce of his own labour, except the farmer, enjoys the right of supplying the home-market with the commodities, which he offers for sale, and is protected in the privilege of receiving gain from his industry. But whenever the badness of the season and the scantiness of the crop, which ought, in fairness, to be felt by the whole nation, affects the farmer's resources, the ports are thrown open; and instead of enjoying the exclusive profit of his own commodity, when he may stand most in need of it, his gain is snatched from him, by persons, who speculate in importing foreign grain from countries, which, by paying lighter taxes, can afford to undersell the British farmer.

Under the article *Provisions*, I ventured to make some remarks on the corn-law; and proposed, with diffidence, some amendment on that delicate subject. Were the ports to be opened and shut gradually for exportation and importation, under certain restrictions there taken notice of, it is hoped that the price of grain would be less fluctuating, that the price of labour would rise more slowly, and that the farmers of this country would reap the fruits of their industry more fairly, than is possible for them by the present unsettledness in the value of grain and the capriciousness of the markets.

7. *New Canals.* A plan was proposed near thirty years ago, to make the Forth navigable, between the Cruives of Craigforth and the bridge of Gartmore, partly by following the course of the river, and partly by a canal. An engineer gave in a plan and estimate both of the canal along this tract
of

of the Forth, and also of the lower part of the Devon, to the Board of Police, when that board existed. The fall of the Forth is twenty feet in that distance; and the navigation twenty miles long. The navigation in the Devon is shorter, and the fall less. Unless this plan were adopted, it was at the same time proposed, to carry on a cut through the interior part of Monteath, by the water of Goodie, which in seven miles, falls only five feet, and is already cut at a proper breadth, in straight lines, through a considerable part of its course.

From the improved state of that country, and the ardor of the farmers to improve it farther, there is not the smallest doubt (whatever might have been the case at the time alluded to) that the tonnage, which would willingly be paid, at present, for coals and lime and other articles imported from Stirling, and the exportation of grain and other commodities carried down to enter the great canal, below Falkirk, would bring a high dividend on the shares of the money sunk, which on both these canals was estimated at no more than £ 5830.

A Canal might be made a great way up the tract of the Earn from the Rhind where it meets the Tay. A Canal might be made along the Pow, which is very similar to the Goodie, between Crieff and Perth; and a fine country, which is very distant from lime and coals, would be rapidly improved by facilitating the conveyance of articles, which are so essential to all improvements, from the port of Perth. I understand that some years ago, a survey was proposed to be made of a canal in this direction, not only as far as Crieff, but to the east end of Lochearn: by which means raw Limestone might easily find its way into the very heart of Strathearn, from a quarry, which is inexhaustible. One might gratify

gratify his benevolence, anticipate the operations of future ages and amuse the fertility of a sanguine imagination, by pointing out the practicability of making other canals, in various parts of the county; but these flights of fancy must be restrained. What is evidently practicable and highly conducive to the prosperity of the country must alone be proposed; which has all along been adhered to, in this report, according to the best of my judgment; and no indulgence given to theoretical schemes or airy speculations. No other canals can at any time be equally advantageous to the county of Perth, with those mentioned, because they communicate with the sea and reach the tide way; which few or none else can.

8. *Corresponding Societies.* To promote the views of the board of agriculture and render their exertions for the cultivation of the country more successful, they might request the gentlemen of most public spirit, in each province or county, to establish farming societies; one half of the members to be proprietors, who are improving or desirous to improve their estates, and the other half the most enterprising of the tenants. To induce the tenants to attend, the expence ought to be moderate. Their meetings might be held four times in the year, and all their transactions recorded by a secretary, who would report the substance thereof annually to the Board. A few subjects or queries might be proposed by the Board to the different societies, suited to the nature of their district, so that they would have the collective opinion of the best farmers in the nation, on any difficult point, before them, at one time. The general tenor of the business and enquiries of these societies might be left with propriety to their own choice. The Board would repay the good offices of these corresponding societies, by solving the difficulties,

which would occur to them, in the management of rural affairs. These societies, being properly constituted and regulated with prudence, would, like the planets in their several orbits and at their respective distances, reflect on the world, that light, which descended for the benefit of men, from the fountain of agricultural illumination. The present professor of agriculture in the university of Edinburgh would not decline, it is presumed, to establish one, for an example to his successors and for the good of his country.

If at any future period, the disposal of the public money should devolve upon persons, who were indifferent about the progress of improvements, and grudging the small salary of the Board; it might experience a powerful support, even in its pecuniary resources, from the collective body of its friends, associated in this manner, who wished well to the Board, as a channel of promoting the national prosperity.

The first dawn of improvement in this country, and probably in all others, was owing to societies of this nature, composed of enlightened and patriotic noblemen and gentlemen.

Luminaries of the same kind, which at first did shed the rays of agricultural knowledge on this part of the world, can alone bring it to its meridian splendor. The efforts of individuals are like so many detached tapers; but collected into one, they spread a blaze of irresistible light around them. The benefit arising from institutions of this nature are so perspicuous and of such magnitude, that they must occur to every reader, without being pointed out.

9. *Dogs.* Useless dogs are the greatest nuisance that can be imagined; and for some years canine madness has produced so many lamentable effects, that a remedy is loudly called for. If every dog were taxed at the rate of three or five shillings yearly, those which are useless would soon disappear,

appear, and those which are valuable could afford to pay the tax. The dogs in most, if not in all counties of this part of the kingdom, consume more food than would suffice to maintain all the poor within their bounds; and many persons keep dogs, who are themselves supported at the expence of the public.

A tax has lately been laid upon the dogs of a certain description of persons, but the tax does not appear to be sufficiently general. The very dogs are excepted, which ought especially to be included. By the present limitations of the act, the tax can produce very little revenue, next to nothing; but if it had extended to all dogs without exception, the revenue would have been considerable, while at the same time, tinkers, gipsies and sturdy beggars, would keep no dogs to annoy the families where they ask alms.

The tax laid upon watches and clocks in the last session of parliament is exactly in the same predicament, and liable to the very same objections. There ought to have been no exceptions in the one case or in the other. Both are luxuries; and such articles are the most proper objects of taxation. The necessities of life, especially such as affect the lower classes of the community ought to be treated with a tenderness which humanity dictates; but superfluities ought to pay well, because every person who uses them, can either afford to pay for them, or has it in his option, to decline their use.

10. *Public Burdens.* It was formerly remarked that a number of distinct small sums, laid on a tenant in his lease besides the landlords rent, galls him beyond measure. He is fretted with these, because he considers himself as having no value for them. He never conceives, unless he be more liberal in his sentiments than common, that the land-tax,

minister's stipend, &c. are a burden on the ground he possesses, as legally due, as the rent which his landlord draws : yet when a demand is made upon him for any of these items, he criticises the measures of government through the medium of ignorance and prejudice, and deplores the defection of the times—The various taxes collected by the officers of excise and customs do not rankle his spirit so much, because he does not discern the train, by which they come out of his pocket. Were the proprietors to add these, and other small sums, to the aggregate of the rent, to charge the whole as due to themselves alone, and to pay all public burdens by their factors, they would prevent much peevishness and many heartburnings, which however ill-founded, often breed the most serious consequences. Heritors would thus save their people from becoming the tools of designing men, who watch the opportunity, for sinister ends, of blowing the hidden embers of disaffection into a flame, which is at all times more easily kindled than extinguished. By doing so, their own yearly income would not be lessened a penny, while they would have the satisfaction of being instrumental in promoting the peace and prosperity of their country, by preventing the irritation of the public mind.

11. *Married Servants.* In place of unmarried servants, if the farmers, who have large possessions, were to build, in a convenient place, a few houses for married people, they would be better served in the mean time, their servants would be more loath to leave them, and the population of the country would be fully supported. It is a mistaken and an illiberal opinion, that all married servants are dishonest. They are not more so than others. Nay they are under many ties to be both faithful and honest. They have a great interest in preserving the good will of their master.

They

They have several things at stake, which involve their present comfort and the future prosperity of their families. As a motive to the master, their children would always be at hand to perform many little offices, for less hire, than boys engaged for a whole year at regular wages; and in due time they would grow up to be the hardiest and the most expert of all principal servants for a farmer.

12. *A proposal*, which would be useful, if adopted. By the vague and inaccurate manner in which leases are generally written, or by the manner in which they are frequently interpreted in courts of law*, much expence is incurred, much animosity is bred, and the landlord often despairs of being able to bind the tenant, by any contract, how well calculated

* A gentleman, who has the best access to know what is passing in public business, informed me that he learned from a high authority, in the present administration of justice in this country "That the principle of procedure in questions relative to breaches of these contracts, (especially a departure from a rotation,) which is adopted in the interpretation of the law, is, to ordain damages in no case to a proprietor, unless the stipulated mode of cropping be departed from during the three last years of a tenant's lease.

With all possible deference to so respectable authority, every farmer must know that this maxim is erroneous. *Aliquando dormitat Homerus*. What the principle takes for granted, may in some cases be impossible; in most cases it is improbable. If a tenant become bankrupt, and the lease be forfeited or adjudged any time before the last years of the contract, it is impossible.—Few or no rotations are in *threes*; they are generally in *sixes* or more: so that it is not probable that any man, let his inclination and ability be ever so great, can, in the space of any three years of his lease, put his land in the state contracted for, in one rotation out of fifty.

The damage done to a farm, by a departure from the stipulated mode of cropping and by the adoption of scourging crops, has been taken notice of, under the article of leases; It is so injurious to a farm, for some years thereafter, that no man can form any estimate of the loss, who is unacquainted with the cultivation of land.

calculated soever it may be, to promote the good of both parties. The discovery of lime and marle therefore, as manures, has in many instances contributed, rather to exhaust the soil, than to promote its fertility. The soil itself, a national property of the utmost consequence, has rather suffered by the imprudent use of these stimulating substances, which might have doubled or tripled its value. The interest of the whole nation is intimately concerned, in having the soil managed in such a manner, that its fertility may not be impaired by ignorance or avarice, but promoted by every possible means, and in every practicable degree.

The nation at large, the proprietor and the tenant have an interest in the soil. The proprietor having a perpetual right, must be more interested in the improvement and increasing productions of the soil, than the tenantry who have only a temporary right, and who will therefore naturally endeavour to make the most of the land, during their lease. This being at all periods the natural bias, has been more easily gratified, since the tenantry have been in the practice of using so liberally the stimulating manures. These manures indeed form the basis of improvement, but in the hands of men, who have only a temporary interest in their possession, they may be rendered the means of reducing the soil to a *caput mortuum*; which in many cases has already happened. Had the tenantry, on the other hand, been restricted to a proper rotation of crops, the soil might have derived almost an infinite progression of additional powers of fertility from the increasing quantity of dung, *the food of land*, which the stimulating manures, by the luxuriant crops they throw up, enable the tenant to command.

It is hoped therefore that it is not foreign to my duty to suggest, that, if the law of the land does not empower heritors

tors to restrict their tenants to specific modes of cropping, or if the present mode of interpreting the law does not render contracts of this kind binding, a law should be enacted, conferring that power, and rendering these contracts as obligatory as any other contracts. Without an amendment of our law in this respect, the influence of the Board itself, upon the improvement of the country, can have less effect than otherways. What does it avail, although the most enlightened of the proprietors should be persuaded of the propriety of new modes of cultivation, recommended by the Board, if these modes can be eluded and never carried into effect? This law ought to embrace the interest of both heritors and tenants. The substance of it might be that whatever additional rent, by way of penalty, a farmer by signing his lease agreed to pay, upon a departure from the restrictions and prescriptions it contained, he should be found liable to pay that sum. And on the other hand, that it should be competent for the lessee, before or after a departure from the articles of his contract, to demand a jury, one half being proprietors of land, and the other being farmers, the sheriff of the county or his substitute being umpire, who might decide upon the propriety of his departure, as it should appear to them to be more conducive to his interest, and no less so to the improvement of the farm, than the mode of management prescribed in the lease. This would put the matter on a fair and equitable footing, between both parties: nor does it appear, that any reasonable objection can be made against it. The contract is voluntary and the engagements are reciprocal on both sides; and farmers are qualified in their own line to judge, with as much accuracy, as heritors, of what has a tendency to promote their own advantage.

Upon

Upon the supposition that three, four, or even five pounds per acre (which has an appearance of great magnitude indeed to those who understand not the case) were the penalty, or the additional yearly rent, stipulated to be payable for the land cropped differently from the mode prescribed in the lease; to a person in any tolerable degree acquainted with the cultivation of land, it must appear evident, that any of these sums is no adequate compensation for the damage which may be done to a farm, by a scourging crop or two; because it may be reduced to such a plight, as may render it necessary, either to re-let the ground under a new lease at five or eight shillings an acre cheaper, than what it would have brought before the scourging crops were taken; or that the proprietor shall be at the heavy expence, for some years, of putting the farm again in heart, before he can find a tenant to take it at a reasonable rent.

Nevertheless it must be observed that the rotation may be as *capricious* on the one part, as scourging crops are unjust on the other: and although this cannot happen, when the proprietor understands farming, or has a factor who understands it, yet there are so many circumstances relative to soil, to climate, to manure, to markets and the state of the country, which ought to regulate rotations; that it requires much deliberation and perhaps many trials, to fix on the best possible mode of cropping in any particular place. A rotation taken from books, even books in high estimation, may be dangerous, because either the climate or the soil or the command of manure or the stock and intelligence of the tenantry, to which the book refers, and which were familiar to the writer, may all or at least some of them be extremely different from yours. In which case your project will fail.

Rule

Rules of farming and rotations of cropping may be very good in Middlesex, which are very absurd in the county of Perth; and even in this county, the practice which may be followed with profit in one province, might be detrimental or impracticable in some other. Hence arises the embarrassment and danger of adopting modes of cultivation at random, without regarding the local circumstances of different countries; and the want of judgment in prescribing rules dogmatically, while these discriminating circumstances are overlooked.

A proprietor who understands human nature, will descend a little and consult the most knowing and the most free of prejudice among his tenants, or will advise with another proprietor, who is master of the subject and whose estate is similar in its natural qualities to his own. He will enjoin that management, which, from all this collected information, appears to be most conducive to promote the interest of his own property and the prosperity of his tenants. If he wishes to introduce something which is entirely new and untried; by obtaining the consent of the persons most free from prejudice, (which is a compliment paid to their understanding) this new thing will not only be adopted without reluctance, but will in a short time be diffused among the rest, without employing any strong measures to make it general.

Upon the supposition that the contract betwixt landlord and tenants were binding on the latter as well as the former, a *positive* rotation of crops need not be prescribed in the lease, except to an ignorant peasantry, whom the proprietor has to reclaim, from barbarous modes of cultivation. Wherever there is a tenantry, who have acquired habits of industry, who understand the management of land, and are able and willing to improve their farms, it will be only necessary to restrict them from carrying fodder off their possessions, to labour

K k k

their

their ground in regular divisions, never to sow two white crops successively in the same field, to lay only a certain proportion of their farm annually under lint, and some other conditions of that nature, which may not be thought arbitrary.

Then, and not till then, will farming flourish and the genius of agriculture smile upon us, when the restrictions in leases are few and reasonable; and when the contracts between landlord and tenants are equally binding on both parties. No good reason can be given, why they are not as binding as other contracts, but there are many reasons why they ought to be equally so.

13. *The improvement of land a profitable speculation.*

Waste land is a raw material, which cannot be wrought up beyond its own natural productions, without the application of capital; and the effect of this capital, in enhancing the value of land depends on the intelligence with which it is applied. The capital drawn from estates, by persons possessed of landed property, is not so uniformly applied towards the melioration of the soil and the increase of revenue, as other capitals are by men in different lines of life, to increase the revenue on which they depend. The capitals derived from trade and manufactures are more frequently and more plentifully directed towards the enlargement of those sources of wealth from which they flow, than the rents of lands to the improvement of these lands which produce them. The richer the merchant becomes, the more he increases his shipping; the more wealthy the manufacturer grows, the more he increases the number of his workmen: and from the enterprize to which either of these has been accustomed in prosecuting his professional business, the moment he becomes a proprietor of land, he outstrips all other proprietors, as the most ardent and most successful improver. The same ardor employed

ployed in the line of their profession changes its object, but not its end. Is the wealth which is generally derived from the soil, employed in this manner? This wealth flows either into the hands of the farmers or into the coffers of the proprietors; partly into both. Farmers cannot afford the advance of the capital in question, upon ordinary leases. It would be unjust to urge it, and in vain to expect it, from them. They have too little hold of the raw material, to proceed upon this expenditure with remote speculations of being reimbursed. It rests therefore with proprietors, and with them alone, to apply capital in bringing this raw material to its highest value: and they have every inducement to do so. Their property is better secured, than that of any other class of men. The merchant ships his goods under the hazard of winds and waves, under the hazard of captures by enemies, or the failure of payment by those to whom they are consigned; under the hazard of mismanagement by being stolen or embezzled, and a thousand accidents, which no human knowledge can foresee, and no human prudence guard against. The manufacturer may be undone by many of the same causes abroad, by accidental fire and by the caprice or exorbitant wages of his workmen at home. Do any of these casualties endanger the application of capital in the improvement of an estate? None. No capital can be more *secure*; and it may be added that no application of money can be more *productive* of wealth. Every person will allow its being secure, but perhaps some may doubt its being more productive. That I may not be thought to speak at random and without evidence; in one of the numbers of the appendix a gentleman in the Stormont, a district of this county, has proven that a piece of land, which had been let some years ago at 23*l.* to a farmer, who relinquished his possession, because he was

unable to pay that rent, is now let at 240l. of a well paid rent, besides some casualties. I met with other instances nearly similar, both in that country and in other provinces. Where is there profit in trade equal to this? where is there a return from manufactures, that can be compared to it?

To discover that there are great tracts of waste land in this and in all the counties of the kingdom is an easy matter; and to demonstrate that the improvement of those wastes would amply repay the expence is not difficult; but the great difficulty consists in persuading those persons, in good earnest, to set about the business, who alone are able, who alone have a permanent interest in the soil, who alone will derive the greatest revenue from it, and on whom alone rests the cultivation of waste lands. Will not the desire of raising more bread, of increasing the population of their country and its consequent prosperity, rouse them? Will not the gratification of taste in adorning the country and the pure sensations of joy in beholding waving crops of their own rearing in the place of barren deserts and gloomy wastes rouse them? Will not their own interest and the propensity, which is natural to men, of increasing their income rouse them? It is not only to be wished, but it is to be hoped, that they will. Is there still room to doubt or to fear that they shall not heartily engage in this business? Does their situation in life lead them into other pursuits? Does their rank in society prevent them from making the improvement of land any part of their study? These are no doubt stumbling blocks, but many are getting over them. Is the revenue collected from the soil applied, in the measure it ought, to increase its value, and to increase the revenue, which that soil doth produce? In some cases, we must confess, it is not; but in many cases it is; and it will soon be so in more.

more. Who would choose to be among the last in doing good to himself, to his country and to the human race?

In aid of every motive, that can stimulate to the study of agriculture and the practice of cultivation, among certain classes of men, might not distinctions be devised, which flow from the fountain of honour. Our warriors are enobled; our sailors are dignified with coronets; and none repines at their honours or their rewards. This is a spur to their ambition; the love of fame mingles itself with their patriotism; and they have gallantly earned the laurels, which they wear. If once the attention of men were fixed, and their exertions called forth, by any or all of these motives, to their own, and still more to the interest of the nation, our great men would distinguish themselves no less as improvers and friends of their country at home, than they do as generals and admirals abroad.

In order that nothing, which others can do, may be wanting to induce landed gentlemen to apply their minds and to lay out a part of their income in the improvement of their estates; and to influence monied men to invest their capital in land, it is perhaps incumbent on the Board of Agriculture, in a detached publication, to hold out to these men, from the most unquestionable authorities and in the clearest light, the advantages of employing their money in the cultivation of land. The Board might also facilitate to them the means of procuring proper persons to aid them in the application of the capital allotted for this purpose.

14. *The Burdens* of the nation ought fairly to be borne by every class of the community in proportion to their wealth; yet the landed interest bear more than their own proportion.

It is injurious to the success of agriculture that money vested in land should pay more towards the support of government,

ment, than that which is laid out otherways. When a man comes home, with a considerable fortune in his possession, he naturally deliberates, where he can best secure the wealth he has gone so far and undergone so many dangers, to acquire. He sees at once, that in no bottom can it be more safe than in land. He next considers, where it will make the greatest returns. The purchase of landed property, if judiciously made and followed out with intelligence, in the improvement of an estate, will make very ample returns. But if he happens to revolve in his mind, where his money is liable to the fewest draw-backs, where least of his nominal income shall go out of his own pocket, where there are fewest drains and least to be applied to the payment of taxes, he relinquishes the idea of purchasing land, and invests his money in the national funds.

Every subject of the British empire enjoys the protection of government equally, for the security of his person, his liberty and his property; and therefore every subject ought, in justice, to contribute fairly towards the support of government, in proportion to the wealth he is possessed of. Protection and support are reciprocal. He who has more at stake, requires more protection, and ought to contribute more. He who has less at stake, may in justice contribute less. The idea of all impartial taxation is either tacitly or openly, to lay on public burdens *ad facultates*: either according to the property which individuals are actually possessed of, or to the property, which, by the rank they assume in society, they wish to be thought to possess. This is a maxim in finance, which is undoubtedly founded on the nature of our constitution, whatever may be the case in other states.

The merchant contributes liberally, for the protection of his trade, by his payments at the custom-house; and he

moreover

moreover increases the number of our seamen : The manufacturer pays various taxes by the different regulations of the excise laws ; and promotes the population of the country by the increase and establishment of villages. The proprietor of land pays a greater variety of taxes than either of these ; besides that he improves the face of the country, makes the soil produce more food, and supports the increasing population. The securities on money lent, the payment of money which is due, and its conveyance from one person to another are all taxed, to a certain amount, by the duty on stamps. Yet the vast wealth vested in the public funds pays nothing for the support of government, in proportion to any of these, if it pays in any proportion at all. It adds neither a sailor to our navy, nor a house to our villages, nor a bushel of corn to our stock of grain. What may be the reason of this exemption with respect to taxation, I shall not say. But there is no question that the creditors of government have an equal stake in its security and derive an equal benefit from the protection it affords, with any class of the community ; and therefore they ought to contribute equally to its support. Supposing the wealth vested in the British funds to be four hundred millions sterling ; supposing again this money to produce only five per cent annually to the proprietors of stock, they draw twenty millions, as the income from their property. The land tax and all other public burdens, affecting landed property, may amount, at an average, to five shillings in the pound. If the proprietors of funded wealth were therefore to pay into the national treasury, in the same proportion with persons, who have a property in land, the yearly revenue from thence arising to the state would be five millions. If every species of property ought to contribute proportionally to the support of that

government

government by which it is protected and secured; and there does not appear any good reason to the contrary; the holders of stock, both British and foreigners, ought to pay in proportion to the holders of land. These two classes of proprietors pay indeed other taxes to government, according to their rank in society, and according to our sumptuary laws, from which neither of them are exempted, and from which no objection can be drawn against this reasoning: but the full elucidation of this point, and of the other collateral circumstances which occur, as connected with this subject, is left to the consideration of those, who will adopt the measure, if ever it shall be adopted*.

The original idea or duty of supporting the government of any country rested on the landholders: and on them alone. Why was this the case? Because there was no other property at that time to be defended. But things are very different in our day. There are many other species of property; although that in land be still the most splendid and perhaps the most valuable; and to the credit of the landed interest of this country, it is uniformly observable that they are always the foremost to make their appearance at any crisis, with the offer of their lives and fortunes, in supporting the government of their country. But the creditors of the public, who possess more wealth than any other class of the community, and have fully as much at stake, and as much interest at least in the stability of government, have not hitherto contributed, in the proportion, that others have done: by which means money vested in landed property pays more than its just proportion into the national treasury, which

* Since the M. S. of this Report was finished and committed to the Board in Autumn 1797, an assessment of 10 per cent has been laid by Parliament on persons of every description, whose yearly income amounts to 200 l. or upwards.

which lessens its value and retards the improvement of the country.

Not only the public creditors, but all other classes of men ought to be called upon, in critical times, to support the expence of government. The church receives protection; and therefore the church ought to contribute her share. The banks and all other corporate bodies of men, who enjoy their property, in security, under the shield of Britannia, ought to strengthen that shield, which defends their lives from bloodshed and their property from pillage. By a fair estimate of the income of all persons, of whatever profession, of whatever age, and to whatever class or denomination of the commonwealth they belong; the public burden of the state ought to be laid on the whole shoulders of the nation collectively, that no particular class may have more than their own share of the load. All are protected alike; and all ought to bear alike in proportion to their ability*.

CONCLUSION.

OF all arts, which employ the ingenuity of man, agriculture is not only the most ancient, but the most useful. Upon this all other arts depend: and men in every rank of society, from the highest to the lowest, are supported by its

L 1 1

fruits.

* I am highly pleased with the coincidence between these sentiments and those expressed by a right reverend prelate, formerly quoted, in his address to the people of Britain, whose profound erudition, whose ardent love for his country and for the cause of truth do honour to the British nation. This section of the report was written as it now stands, a whole year before that animated address made its appearance.

fruits*. A well cultivated soil is more valuable than all the mines of Peru, and more precious than all the pearls in the ocean.—But agriculture is a complicated art, and admits of different degrees of perfection. Without *experience* without *application*, and without *capital*, it cannot be prosecuted with success. He, that professes this art with capital alone, will find himself defective in some of the most necessary qualifications. He exposes himself to the ridicule of the world; and what is worse, to the danger of hurting his own circumstances.—Does the banker entrust the management of his capital to his son, without a previous acquaintance with all the intricacies of his profession? Does the manufacturer think his wealth safe in the hands of his son, before he be bred to every branch of the business, which he is about to profess? Or will the merchant commit the direction of his trade to any, who is not thoroughly acquainted with the commodities and the markets of different nations? No. Even in the common arts of life, there is a certain degree of knowledge, of practice and assiduity, which is deemed as necessary, as the possession of capital. And shall the young gentleman, whose capital is in land, be the only exception to this general rule, which is so essential as to be adopted by all other classes of men, in conducting the affairs of life? If he is an exception, it is at his peril. His future experience is sometimes bought very dear. Varro says, “That we may excel in agriculture, we must not only study the example of others, but by our own experience, try to improve upon their practice†.

No.

* I beg leave to recommend an attentive perusal of this chapter to the persons of rank in Great Britain, who are possessors of its soil.

Mr Dann of Gillingham.

† Debemus et imitari alios, et aliter ut faciamus quâdam experientia tentare. *Lib. i. cap. 18.*

No man can be a farmer, without personal experience; and this experience cannot be suddenly acquired. All the books on earth will not suffice; and occasional directions, founded on the experience of different persons, will create such a jumble of ideas, such a confusion of plans, and such a contrariety of procedure, that no effect can follow, but disappointment and chagrin. If experience, therefore, must be acquired, I shall suggest two directions which may be found useful, in case this Report shall be read by any person, who may be desirous of obtaining that experience. 1. Let the first rudiments of farming be learned under the tuition of a person, who is master of the business, and who labours soil as similar as may be to that, on which you propose to make trial of your skill. 2. Begin your operations on a small scale, that you may not be embarrassed in your outset, by their complicated extent, by adverse seasons, or by disappointment in your hopes of success. If Virgil's rule be a good one to any farmer, it is surely indispensable to a young one. "Praise an extensive farm, but cultivate a small one*." Many other directions might be given, which are of great use; but these seem to be the most essential: and both my duty and inclination lead me, not to deter, but to encourage. If errors are to be committed in the first essays of any business, are they not of least danger, under the eye of a skilful teacher and on a small scale? Columella says, "Experience and application are the best masters; nor is there any profession, in which we do not receive instruction even by our own faults†."

L I I 2

But

* *Laudato ingentia rura, exiguum colito. Georg. lib. 2. line 412.*

† *Usus et experientia docet, neque est ulla disciplina, in qua non peccando discatur. Lib. 1. cap. 1.*

But how is this to be brought about? How are the young gentlemen of the British nation to be persuaded to relinquish the airy pursuits of youth, for the ignoble trade of a farmer? Let us reflect a little. These are seated in the imagination; they are not under the controul of reason. They rise upon opposition, and are not to be overcome by attack. If the fortress of vanity cannot be stormed, let it be taken by sap, orfoothed into a capitulation by the offer of favourable terms.

The simplicity of rural occupations preclude corroding cares and these agitations of hope and fear, which are incident to the bustle of the world. Their innocence relieves from the temptations to vice, which ever infest crowded population. The purity of the exhalations from the soil is more favourable to health than the smoke and putridities, which taint the air of large cities. The breath of the morning, so much celebrated by poets and philosophers, for its benign influence on the mind and on the body, is, in no other way of life, enjoyed in such perfection. Without health there can be no enjoyment: without health riches can purchase no pleasure: without health neither power nor property can procure happiness.

Virgil in his second Georgic, has given an inimitable description of the pleasures of a rural life *.

An easy quiet and a safe retreat,
A harmless life devoid of foul chicane,
And home-bred plenty the rich owner wait,
With rural pleasures sporting in her train.
Unvex'd with quarrels, undisturb'd with noise,

In

* At secura quies, et nescia fallere vita
Dives opum variarum: at latis otia fundis,
Speluncæ, vivique lacus. *l.* 467. &c.

In peaceful industry time glides away :

He, living lakes and flow'ry fields enjoys,

Woods, hills and dales, and streams that thro' them play.

No trade is ignoble, if it were fashionable. No pursuit is dishonourable, if it were countenanced by persons of rank. Make agriculture the *ton*; and our young men of fortune will follow the fashion.

Many great men of antiquity have been brought from the plough to command armies and to serve their country in offices of trust, of dignity and of danger. Did not Curius Dentatus, for instance, who had thrice the honour of a triumph and drove Pyrrhus out of Italy, come from the plough and return again to improve his farm. Cicero says, "The ancients brought men from the plough to fill the highest offices of the state."* The same author adds, in his book of offices, "Of all the sources of wealth or pleasure, none is more sure than agriculture, none more productive, none more delightful, none more worthy of man, none more becoming a gentleman."† Pliny tells us "That generals improved their fields with their own hands. The earth (we may believe) rejoiced to be turned up by a plough adorned with laurels, and by a ploughman, who had been honoured with triumphs; because he could handle the plough and wield the sword with equal ability, and lay out his fields with the same diligence, that he pitched a camp."‡

Emperors,

* Antiquitus ab aratro arcessabantur, ut consules fierent. *Pro Rosc.*

† Omnium rerum ex quibus aliquid conquiritur, nihil est agriculturâ melius, nihil uberius, nihil dulcius, nihil homine, nihil libero dignius.

‡ Ipsorum manibus imperatorum colebantur agri, (ut fas est credere) gaudente teriâ vomere laureato et triumphali aratore; sive illi eâdem curâ semina tractabant, quâ bella, eâdemque diligentia arva disponebant, quâ castra. *Plin. lib. 18.*

Emperors, kings, philosophers and statesmen, have had a pride, not only in ancient, but in modern times, to be accounted farmers, and have written upon that subject. Nothing is better calculated to make agriculture the fashion at present in this country, than the establishment of a professional board, composed from among the most enlightened, the most patriotic, the most accomplished, and the most dignified characters in our age and nation; patronised by a sovereign,* who loves his people and is beloved by them; and supported by the countenance of a respected and intelligent parliament.

The soil is the public stock, the great capital, the stamina of the nation. All other riches are fluctuating and may vanish; but this is wealth, which Britons shall enjoy, as long as they enjoy their country. We may hope therefore, that this is the happy æra, in which the improvement of the soil will be treated with the attention it deserves, that agriculture will become the fashion, that the turf will give place to the plough, and that good oats will be sown, instead of oats that are wild.

O happy, if they knew their state,
The swains, who, free from bus'ness and debate,
Receive their easy food from nature's hand
And just returns of cultivated land.†

Marks of distinction in the improvement of land, which ought to be held out as a spur to the ambition of those who wish to excel, the shining example of many of the present proprietors, to which their own estates can bear testimony,
more

* De cultura agri præcipere *principale* fuit. *Plin. lib. 18.*

† O fortunatos nimium, sua si bona nôrint

Agricolas! quibus ipsa, procul discordibus armis,

Fundit humo facilem victum justissima tellus.

Virg. Georg.

more than any thing I can say, the growing taste and spirit of the times, will all conspire to draw the attention of the rising generation to the most healthy, the most innocent, the most pleasant, the most profitable and the most patriotic of all pursuits—the improvement of the country: and the difference of rank will not be marked merely by accidental circumstances, which are derived from ancestry: but by the true distinction of doing good, which is meritorious, by being personal.

If the line of cultivation, which the present age has marked out, shall be followed by succeeding heirs, it must, and doubtless will be adopted by the tenantry at large, and advance rapidly to perfection. Then every acre will be cultivated to the highest advantage; then the increase of the food of man will have the effect of increasing the number of men; then Britain will become, in the language of a great man, “The garden of Europe”; then wastes, which are not worth at present, more than one or two shillings the acre, will either be broken up by the plough, or produce six shillings in planting; then the barren glebe, which makes but three scanty returns, will be left in pasture to recruit its strength; and the soil adapted for tillage will, by the alternate changes of white and green crops, reward abundantly the labours of the husband-man and demonstrate to the world, how much Agriculture has been perfected by my country-men.

APPENDIX—No 1.

TOPOGRAPHICAL DESCRIPTION.

IN a surface so extensive, it may naturally be supposed that the country exhibits an appearance very much diversified. The grandest object, which attracts the notice of a stranger travelling northward from Edinburgh or Glasgow, is the boldness of the Grampian Mountains,* piled upon one another in huge masses, which extend not only the whole length of this county, but reach across the island from Aberdeen on the German Ocean, to Cowal on the Atlantic. The southern front of these mountains, which runs from south-west to north-east, has in many places a gradual and pleasing slope into a champaign country of great extent and fertility; and notwithstanding the forbidding aspect, at first sight, of the mountains themselves with their mantle of heath and rugged rocks, they are intersected in a thousand directions by winding vallies, which are watered by rivers and brooks of the most limpid water, clad with the richest pastures, sheltered by thriving woods that fringe the lakes and run along the streams, and are accessible in most places by roads unquestionably the best in Britain. These vallies,

M m m

where

* Denominated so by the Romans, very probably from *Garu bein*, which, in the language of the natives, signifies *huge mountains*. The general name of that great tract of country, in the counties of Argyle Perth, Inverness and Aberdeen, through which the Grampians extend, is still distinguished by a name similar to this, from which the Romans formed their Latin name *Grampiani*, applied to these large mountains.

where there is such a rich variety of natural beauty, form a contrast to the ruggedness of the surrounding mountains, and present to the eye such romantic scenery as must be admired by every traveller of taste. The rivers in the deep defiles struggle to find a * passage, where the opposite hills approach so near, the indented rocks and impending woods embrace so closely, that the waters rush with incredible force and a deafening roar, in proportion to the altitude of the fall. Then, plains of various extent burst suddenly on the eye, which are filled with villages and well-cultivated farms. Chains of lakes, finely wooded down to the water-edge, are connected with meandering streams, stored with a variety of fish. The hills are covered with snowy flocks, and numerous herds are browsing on the pastures below.—The noblemen and gentlemen's houses are generally set down on the side of a lake or on gentle declivities facing the meridian sun, with a lawn in front intersected by the winding links of a river, and plantations of stately oaks, beeches and other forest trees on the right and on the left, which together with the hills behind, variegated with planting, increase their beauty and their warmth.—The author has been advised by the Board to place this Topographical Description not in the front of the Report but in the Appendix, in which he has endeavoured to give some account of the general appearance of the surface of Perthshire, its most remarkable rivers, lakes and mountains, the situation, prospects and embellishments of some of the noblemen and gentlemen's

* Provincially called Passes, owing to the difficulty of passing them before the roads were made. The most considerable of these, in the county of Perth, are the pass of Leney, the pass of Coheilig in Glenlochay, the pass at the Spittal of Glenshee, the famous one at Killiecrankie and the pass of Aberfoil.

tlements seats, with such remarks upon each as have naturally occurred.

Along the south side of the Grampians, and on the north side of another range of green hills, there lies a large valley or strath * which runs in the same direction with these mountains, and terminates on the north-east at Stonehaven and on the south-west at Dunbarton, reaching from sea to sea. This strath is of unequal breadth, from 10 to 15 miles over, in different places, and upwards of 100 miles long. It is intersected by many large and beautiful rivers, every one of which is peculiar to this county, excepting two on the east, and one at the western extremity, beyond the limits of Perthshire.

The two Eiks flow through this strath on their way to Montrose. The two greatest rivers of the county are the Tay and the Forth, which collect many tributary streams in their course to the German Ocean. The Tay carries more water into the sea, than any other river in Great Britain. The Earn, rising from a lake of the same name, directs its course nearly due east through this strath for 24 miles, by Drummond Castle, to its junction with the Tay at Rhind (the *Point* where they meet). The Almond falls into the Tay, a few miles above Perth, where the Romans had a timber bridge to cross over the latter to the Stormont. The Isla, after being swelled with the waters of the Ardlie and the Shee, which uniting their streams at Rochalzie are

M m m 2

called

* A word borrowed into English from the ancient language of Britain, which in Scotland is provincially applied to long, wide, low-lying vallies, with a chain of hills on both sides, to distinguish them from vallies, that are narrow, short, and more inland, which are called Glens.

called the Ericht*, surrenders itself to the Tay at Kinclaven, one of the seats of Malcom Kenmore. The Brand falls into the Tay at Dunkeld. The Garry and Tummel, joining at Fafcaly, retain the name of the former and meet the Tay at Logierait. The Lyon falls into the Tay about a mile below Taymouth, where the latter issues from the lake, which gives it the name.

The Forth is also augmented by several large rivers, which swell its current, as it winds its course to the sea. The Devon flows into it at the Bridge of Tullybody; the Allan betwixt the house of Kier and the bridge of Stirling. But the great body of the Forth is composed of two large streams, the greatest one emerging from the Grampians at Callander, and the other at Gartmore, which after a course of many miles and the addition of many waters, unite below Blair-Drummond, and flow under the bridge of Stirling.

The Forth having no dangerous bars at its mouth, and fewer shallows and sand banks in its Frith than the Tay, enjoys more commerce, although the body of its water be not so great. Having the advantage also of being nearer the capital than the Tay; the land on its banks being superior with respect to fertility, except the Carse of Gowrie alone; and entering into a larger arm of the sea; towns and villages and the general population along its sides are more crowded, the soil was improved at a more early period, and the trade more extensive.

Besides these rivers already taken notice of, which all flow in various directions though this great Strath, except the
Devon.

* The Erichts were places of rendezvous for the people in tumultuous times; when they rose to meet their chiftians, on the eve of going to battle. Robertson of Strouan assembled his clan in Gleniericht, a concealed valley between Athol and Rannoch.

Devon. The Enrick and the Blane on its western extremity meet a little above the bridge of Catter, and assuming the name of the former, hold a serpentine course below the House of Buchanan, through the most fertile haughs, into Lochlomond where it is broadest and its wooded islands most numerous, most picturesque and beautiful. From this lake issues the Leven, remarkable for the variety and extent of its printfields, which, being the last stream in that direction that adorns this valley, flows into an arm of the Atlantic at Dunbarton. A tract of country of this magnitude, intersected by no hills of any considerable height and enriched and beautified by so many rivers, is not in Scotland, nor perhaps in Britain; from which circumstance, this vale has deservedly obtained the name of *Strathmore* or the great Strath; although in a restricted sense, that appellation is often confined to the district of Strathmore, which lies between Methven Castle and the village of Lawrence-kirk.

On the South East side of Strathmore there runs a range of green hills almost parallel to the Grampians, and of the same length with the Strath itself, of which they form the Southern boundary. These hills are lower than the Grampians; yet in some places, they rise with beautiful green conical tops to a great height above the adjacent country. They have not one general name as the Grampians have; but from Montrose to Perth, where they are intersected by the Tay, they are called the Seedlaw hills: * from thence to Stirling.

* The *Seed-laws*, it is probable got their name from the circumstance of their commanding a prospect of the German Ocean and of the eastern coast, from Aberdeen to Berwick, which was often the post of danger. Some fanciful Etymologists derive *Ochills* from two words which signify a *young wood*, because say they, wood is found in

Stirling, where they are intersected by the Forth, they are called the Ochills; and from thence to Dunbarton, the Dundaf and Campsie hills. These hills being more verdant and lower than the Grampians have richer pastures, and are better calculated for an extensive range of sheep pasture than the latter.

The only parts of this county, which are situated on the south side of these green hills are the Carse of Gowrie on the Tay, the district of Culrofs on the Forth, and that of Gogar and Menstrie on the Devon.

The only parts of the county south of the Forth are a few farms in the parish of Kippen, immediately west from that village, and some more, stretching from Gartmore through a hilly country towards Benlomond.

Along the banks of the rivers of this county, after they descend from the northern hills into the champaign country, there are extensive tracts of rich land, under high cultivation, adorned with elegant mansions and extensive plantations, which exhibit a pleasing and plentiful appearance. Where the ground swells between one river and another,

the

all the mosses of the Ochills. But every hill in Scotland ought to have been called ochill for the same reason, since wood is found in the mosses of them all. Some other circumstances ought always to justify an Etymology, besides the similarity of sound. The *Dundaf hills* are evidently the *Deer hills*, because their pastures are more rich and more abundant, than any other hills in Scotland, and therefore a favourite haunt of these animals, while they had the choice of their own residence. The *Campsie-hills* are denominated from a valley, that intersects them, which *avoids* as it descends along the course of the Blane. There are many Cambuses in various parts of the country, where the form of the land resembles that posture of the human body: and a thousand places are named after different parts of our body, to which they had a likeness. But it is not my intention to trouble the reader with Etymologies, which are imaginary or uninteresting.

the fertility of the soil on both sides of these ridges decreases gradually, until it ends at last in a barren moor, on the highest part of the ascent. Between some of the rivers, these moors are large, between others less extensive. Some of them rise but very little above the adjacent rivers; others have a considerable swell. They are all covered with heath which is longer or shorter according to the degree of their elevation. In south Britain such tracts of land are called *Heaths*, because they are clad or have been clad with heath: in North Britain they are called *Moors*, to distinguish them from mountains, which for the most part have a similar covering, but always more altitude. This distinction is so carefully marked, that in some parts of the county of Perth, the highest hills of the district, whose sides form an angle of 30 or 40 degrees with the horizon, are covered with a rich carpet of grass; while the contiguous moor below, which is almost in the plane of the horizon, is covered all over with russet heath. On both sides of the Seedlaw hills, on both sides of the Ochills, and in the vicinity of Kippen, these appearances take place.—In almost every part of the county under review, these low moors are undergoing great improvements; and the different modes of cultivation, adopted by spirited farmers, have been taken notice of in their proper place. In general they are more deficient in soil than in climate; and our fathers always rejected the soil that was most barren, because it required most labour to render it productive. Not many years ago, the only improvement of which such land was deemed capable, was planting: and in some places, the moors were deemed so bleak, so barren and exposed, that they were abandoned, as unworthy of any attention whatever. The surface of these moors is universally a thin stratum of moss, composed of the deciduous parts

parts of heath; the soil below is generally gravel, a bed of sand, a barren till, or a poor red clay that retains water.

The most considerable lake in the county is Loch Tay, which is so deep that it never freezes far beyond the water-edge: the cold water always descending by its gravity, and the warmer getting to the surface, till the whole mass be equal in cold to the freezing point, before ice can be formed. This is a fine winding piece of water making some bold sweeps, 16 miles long and from one to two miles broad; with sloping banks, partly wooded and partly under cultivation. It abounds with a variety of fish. The Char are larger than these in any other lake of the county. Loch Tay was agitated on the 12th Sept. 1784 and for some days thereafter, in a manner that alarmed the country people, while no signs of an earthquake were felt in any part of the adjacent ground. The flux and reflux were fifteen feet from the ordinary boundary, where the beach had a gradual slope. Since that period there have been repeated shocks of an earthquake in the vicinity of Comrie, a village in Strathearn, owing probably to the same cause. Loch-Lomond was agitated in the same manner in 1755, when Lisbon was destroyed by an earthquake.

Loch-Ericht is the next lake, with respect to size, being rather longer but not so broad as Loch-Tay. It lies at the head of Rannoch on the confines of this county, and extends some miles Northward into Inverness-shire. Being in the very heart of the Grampians, it is encompassed on all sides, by lofty mountains and rugged cliffs of the most tremendous aspect. In the vallies around Loch-Ericht there is some herbage, but Ceres is a stranger to its banks, having relinquished that possession to heath and a few straggling birches and alders, a haunt for the game of the forest.

In

In one of these vallies, the only delightful spot on its north side, a house of one floor was built some years ago by the present Lord Advocate Mr Dundas of Arncliffe, Mr Hamilton of Pencaitland and others, for the purposes of hunting and fishing, on a feu granted by the duke of Gordon. In this romantic and solitary place, stags and Alpin hares roam undisturbed during the summer and autumn; grouse, heath-fowl and Tarmachans in abundance inhabit every hill: but in the depth of winter, when the snow lies so deep and close that not a green thing is to be seen, they assemble in tribes and are compelled to take their departure, like a flight of pigeons, to more hospitable quarters; even the deer take shelter in the neighbouring forests of Athol.

Loch-Rannoch, which is 12 miles long and one broad and has bull-trouts of 24lb. weight, is situated in a district of that name, on whose banks the only natural fir wood of considerable extent in this county is now to be found. Loch-Earn in the parish of Comrie, whose banks are so closely clad with copse of oak, that the profit arising from the sale of bark and timber is nearly equal to the rents of the arable ground; and Loch-Catherine in the parish of Callander, celebrated for the variety and grandeur of its scenery, are the only lakes worthy of further notice in a general description of the county of Perth.

Ben-lawers on the north side of Loch-Tay is the highest mountain in Perthshire, and the third for height in Britain. Its beauty and its elevation conspire to attract attention. Without being disfigured with rocks, it rises by a gradual ascent from the water-edge of Loch-Tay to the altitude of 4015 feet above the level of the sea. The base has two or three tiers of farms above one another; the middle region is

N n n

green

green pasture; and since the introduction of sheep on a large scale, the verdure is ascending to the very summit.

Benmore at the head of Glendochart is 3903 feet above the level of the sea and commands a most extensive prospect towards the German and Atlantic oceans. In 1769 some gentlemen observed the transit of Venus over the disk of the sun from the top of Benmore.

Shichallion at the foot of Rannoch is more insulated than any of the former. It rises with a conical shape and terminates in a point, at the height of 3564 feet. Although its sides are extremely barren, presenting little to the eye except solid rock with occasional tufts of heath, Shichallion has acquired celebrity, by doctor Maskelyne, astronomer to the king at Greenwich having made choice of this mountain some years ago to make observations on its power in attracting the pendulum.

Benledi near Callander is the only mountain in the county of Perth, which, according to tradition, has been devoted to the purposes of devotion; and therefore the only mountain, which has been dressed on the summit; Its altitude above the sea is 3009 feet; It commands on the east the whole prospect of the Forth and of the rich country through which it flows to the German ocean; on the south the tract of the Clyde with its shining bleachfields and thriving towns lie open to view, by Dunbarton to the extremity of the shire of Lenrick.

Besides these, Bengloe in the forest of Athol, Benchonie at the head of Glenturret, and Benvorlich on the south side of Loch-Earn, are mountains of considerable note. Dunsinnan, one of the feedlaw hills 1040 feet above the sea, is famous not only for the richness and variety of its prospects, but for being the strong hold of the bloody usurper Macbeath, whose

whose castle was built upon its top (of which I shall give an account in the sequel;) and Birnam hill near Dunkeld, 1580 feet high, has still the remains of that wood, from which the royalists marched against the tyrant to cut off his life and put a period to his usurpation. The inimitable pen of Shakespeare has rendered these classic ground.

Turleum, whose height is 1400 feet, forms the back ground to Drummond Castle and presents a fine contrast to the improvements of that place, and the well cultivated country along the banks of the Earn. These and many others merit a detail of which my limits will not admit.

Descending into Perthshire from the north, through the hill Drumuachder, a defile awful by its narrowness and the altitude and steepness of the surrounding mountains, you come down on the Castle of Blair Athol, situated on a rising ground with an extensive plain to the south, which is surrounded by the Garry and Tilt at their confluence. The beauty of the lawn in the highest state of cultivation, the grandeur of the castle which rises like a white cloud in the center, and the thriving plantations which climb half way up the hills, correspond in the highest taste to the piles of mountains that are situated in the back ground. The fallow deer browsing in hundreds in the park around the house, the variety of foreign and native forest trees, the walks and gardens and ponds of this noble place, refresh the traveller's eye, after his dreary ride in the deep and long defile of Drumuachder (the *highest ridge* of hills in Scotland) which is often as fatal to the lives of the unwary in the winter season, as the Caudin forks were to the honour of the Romans. The variety of water falls, the deepness of the glens, the number of roes and wild fowls in their favourite haunts, the sturdy oaks that mock the blast, beech-

es and limes that rear their conical heads, tall larches and a stately progeny of pines, with all their floating foliage, richly robed to the ground, adorn the approach of this magnificent place. The lobby is a museum of the horns, skins and skulls of wild animals. The loftiness and elegance of the apartments are suited to the magnificence of a Ducal mansion, and the thickness of the walls are a proof of its great strength in former times. Yet I could not suppress a sigh of regret knowing that the roof had been modernized and that three floors were taken from its height, in place of all the turrets, embrasures, battlements and parapets, which prior to the year 1747, made the Castle of Athol the pride and defence of the country, were suited to the rude grandeur of the mountains around it and gave the place such a venerable air of antiquity.

Near the pass of Killicrankie and below the house of Or-rat, the place is shewn, marked by a large block of rude stone, where Lord Dundee fell, after having defeated King William's forces under General McKay in 1689. This pass, which is about half a mile long, with a high ascent on both sides almost perpendicular, is astonishingly steep, rugged and wild. The united waters of the Garry and Tilt flow in a chasm, which is worn so deep by the rapidity of the river, so gloomy by the projecting rocks, that seem to close from the opposite sides, and so darkened by hanging wood which grows out of the clefts, that the river is in most places invisible to a passenger on the road, who only hears its deafening roar. And where he sees it, the troubled water is precipitated over a rock into a pool, that boils in the middle, whirling and foaming all around.

Taymouth in Breadalbane is also within the Grampians, situated at the east end of Loch-Tay, which gives their
names

names both to the river and the place. The Castle, with grotesque figures engraven on its front, is situated in one of the links of the Tay, which flows behind with a swift, strong but smooth current. The pleasure ground on both sides of the river extends to the base of the opposite hills, and from the lake on the west for some miles down to the confluence of the Tay and Lyon. A Chinese bridge near the castle, renders the access easy from the one side to the other. The sloping banks of the Tay are finely wooded, with well-dressed walks on the top, which correspond to the windings of the river, while the clear stream that runs smoothly below, is seen through the intervening trees; and the herds of fallow-deer, beautifully dappled, roam at large around the house sporting with their fawns or staring at strangers. The variety of the ground exhibits every moment new scenery, the swells and the walks being adorned with summer houses temples and seats. The hills are generally planted with a variety of wood up near to their summit: and their base fringed with more laburnums of size, than I have seen in any other place. The neat village of Kenmore and its elegant church are happily placed on a promontory at the east end of Loch-Tay, commanding an extensive view of the lake, of the island of Nuns and the barge moored in its lee. The fort situated on an eminence, fronting the castle on the south with all its apparatus of flag-staff, swivels and glacis, embrasures and bastions, is perhaps the best station for viewing the whole landscape at once. The magnificent wall of great limes behind the castle is singularly grand, whose outer branches hang to the ground, whose inward branches rise aloft and form a long Gothic arch impetuously by a ray of the sun. The reflected light adds a venerable air of solemnity to this walk beyond all others about Taymouth.

Some

Some minute ornaments in the parterre style, introduced lately on some other of the walks, may not please every taste; being more suitable to a small villa near a town, than to the grandeur of a great place, where the lake, the river, the park, the walks and plantations are all in a very superior style. The Hermitage of Taymouth about a mile west on the south side of the lake is singular for the loneliness of its situation and the grandeur of its prospects. The hermit's cell is entered by a winding subterraneous passage, gloomy and solemn, with occasional peeps of light through the arched rocks above. The walls are clad with moss, the bed and seats are covered with the skins of wild animals. In front of the hermitage, a large body of water is precipitated over a perpendicular rock 240-feet high, into a large pool that boils and wheels and foams below. This white sheet of water in its fall touches the trees on either side, until it is lost from the eye in a glen, deeply awful and darkened all around with hanging trees.

On the right side of the Tay, a little below Tay bridge are the falls of Moness, singular for their variety and their altitude. A walk guides the traveller to this romantic scene. A succession of cataracts and cascades in one place tumble furiously from rock to rock; in other places, the whole waters rush with a hideous roar over precipices of immense height, until they are lost from the view among gloomy woods and impending rocks at the foot of the glen.

Dunkeld, once the capital of the Caledonians, and in later times a Bishop's see, is a most romantic place. The house is modern and neat; the gardens laid out with taste and kept in the highest order. The valley is narrow; but the scenery is pleasing and extensive. Ruins in a fantastic style are placedⁿ on eminences, where they peep through the trees

on the hills, whose sides are clad with waving foliage down to the very brink of the river, their foot is washed by the Tay, deep, broad and silent. The Cathedral is a venerable pile, but not large. On the opposite side of the Tay the Hermitage called Ossian's hall, which is situated on a rock 40 feet high that hangs over the water of Braan, has so much the appearance of peril, that a person of weak nerves, when his situation is discovered, can scarcely believe himself out of danger. The whole water seems to rush against him, streaming with foaming violence, reflected in different lights by mirrors of various colours, and forcing its way with noisy fury through an abrupt rocky descent, into an abyss where the waters wheel and boil below.

Methven Castle, is a commanding situation, built upon a rising ground not far from the confluence of the Almond and Tay. The prospect from this place is grand, pleasant and extensive. Strathmore opens to the north-east; Perth with its magnificent bridge and river and rich fields on the south-east. Many new farms rear their heads on the south towards Duplin and Gask, with comfortable steadings, well dressed fields and plentiful crops; where Lord Methven sees, in his own time, the progressive steps of cultivation and the busy hand of industry improving and inclosing land, which some years ago had been bleak and bare, with no covering but heath and a few wretched cottages.

In a south-west view appears Tibbermuir (the fountain of the virgin Mary) where the famous Marquis of Montrose routed superior numbers in 1644, with a few Highlanders armed mostly with the stones of the field. The spot on which the battle of Methven was fought in 1306, between King Robert Bruce and the earl of Pembroke, is not exactly known; after which the former suffered incredible hardships

ships for some years skulking in the Highlands and western isles.

Behind the wood of Methven which consists of 172 acres and is a great ornament to the castle, there is a singular ledge of rocks crossing the Almond, known by the name of the Devil's bridge. One end rests on the estate of Methven, the other on the estate of Lednock, the property of Mr Graham of Balgowan. Nothing remains of this magical bridge except the abutments, all the arches having fallen before it was finished, upon some passenger wishing good speed to the builder. These abutments are some hundred feet high, the stones all nicely jointed, having the appearance of the hewn front of an old fortification.

This ledge is a part of a small chain of rock of an uniform quality, which crosses Scotland from sea to sea, in the direction of south west and north east, almost parallel to the Grampians. In this county it frequently appears above ground, particularly in the breas of Doune, at Muthil, at Methven, and at the Linn of Campsie on the Tay.

Strathearn* is full of gentlemen's houses, and affords such a variety of scenery, that it would be inconsistent with my plan to enter upon a detail. A traveller is perpetually refreshed

* This is the great valley, through which the river that gives its name to the country flows almost with a straight course for about forty miles. The course of the Earn, and of the lake from which it takes its rise, being nearly from west to east, may have given it a name significant of its westerly direction, to distinguish it from the Tay, which runs nearly from the North, betwixt Logierait and the tide-way. Argyleshire (*Jar-ghiel*) has its name from being the most westerly county of Scotland: and (*Jar-ina*) the proper name of Ireland signifies the western isle, being the most remote in that direction, known to those who gave their original names to provinces and islands in this part of the world.

refreshed by the sight of new beauties coming in his view. Owing to the length and straightness of this Strath, bounded by two ranges of hills at the distance of twelve or fifteen miles from each other, with a fine river flowing in the middle and rich land sloping down to its banks on both sides, the noblemen and gentlemen's seats, under the cover of thriving plantations, behold the busy hand of man engaged in the various operations of agriculture, and enjoy prospects equally grand, extensive and beautiful: they see and are seen by one another, forming one great scene, in which every house has its proper station, receiving and reflecting beauty on those around it.

In the lower part of the strath, Duplin castle, where a bloody battle was fought in 1332, fatal to the Scots in the interest of Bruce, is situated on the north bank of the Earn opposite to the meridian sun, enjoying the view of the most open and fertile part of the valley, crowded with elegant mansions, populous villages and farms laden with the most luxuriant crops. Auchterarder bounds the view on the right, which was a royal burgh in the time of the Scottish parliaments; and Abernethy on the left, once the capital of the Picts, still noted for its round tower of singular workmanship, 74 feet high and 48 in circumference, the only one, except that at Brechin, which remains as a monument of that ingenious people.

Time itself seldom changes the names of places, except where the conquerors understand not the language of the conquered. *Aber*, a word very frequent on the east of Scotland signified among the Picts the confluence of waters; and *Inver*, equally frequent on the west, had the same signification among the Scots. Kenneth the II. having finally subdued the Picts and reduced all Scotland into one

O o o

monarchy,

monarchy, adopted the Pictish names of places, south of the Grampians, which had been the territory of the conquered people.

Drummond Castle, at the head of this vale, raises its head above all the adjacent country. In a princely situation, at the termination of a gentle ascent of fertile land, fronting the east, where the country around forms an inclined plane down to the Earn, the prospect is obstructed in no direction. Surrounded with well dressed fields to the south, with woods to the north and a variety of forest trees fully grown in chosen situations, it commands at once a magnificent view of all Strathearn, with its towns and villages and seats and rivers and plantations and farms, from the face of the Grampians on the one hand to that of the Ochills on the other, and beyond this county eastward, as far as the shires of Kin-cardine, Angus and Fife.

The house of Auchtertyre, with a manly front of cut granite, is situated immediately over the lake of the same name. Surrounded and sheltered by thriving copse and stately dropping trees, it enjoys the view of Crieff and of Strathearn to the south-east, and of the rich valley towards Comrie on the west, in which the Earn flows. This situation is delightfully romantic. The durable granite corresponds to the stability of the mountains behind; and the elegance of the apartments to the cultivated fields in its front. The lake winds beautifully among green hills and through the lower parts of the wood: and the marle found in its bottom being judiciously applied has enriched Sir William's own and his neighbours property.

Nature has done much for Lawers; and art has polished and improved nature. The lawn to the south is extensive, and the Earn holds a winding course through the middle.

The

The soil is a fertile haugh, formed by the sediment of the river, and in the highest state of cultivation. The trees are aged and luxuriant, especially some of the finest Scots firs in the county; and the house on a rising ground on the declivity of a hill, with a southern aspect, is covered from every storm by a variety of tall forest trees. New villages are rising in view and old ones extended. Distant wastes are cultivated by the busy hand of industry; and fields of corn are growing where scarcely a blade of grass grew before.

Dunira is a singular place. The scenery from Crieff to Lochearn, a distance of 10 or 11 miles, is in the highest degree romantic and delightful. It is called by travellers the Mountpelier of Scotland. Dunira is the most diversified spot of the whole. Auchtertyre and Lawers are discovered by passengers with ease. They present themselves to the eye. The valley before them is wide and the mountains more distant: But the situation of Dunira shows it to be a retreat from public business and the bustle of the world. From the taste with which all the ground is laid out, one must know there is a house at hand, yet hardly can discover, without enquiry, where it is. Here the valley begins to narrow: you approach the foot of the rugged Grampians; the mountains before you seem to close and to stretch up their towering heads into the clouds. The insulated hills, which are scattered in the plain below, are covered with tufts of copse wood; and the river Earn flows with a meandering course, winding round these wooded hills. The lawn is partly dressed and partly planted with waving belts, in the neatest style, suited to the soil and situation. A Chinese bridge unites the two sides of the Earn, and serpentine walks lead to the most favourite prospects from the tops of the hills: a rustic bower on the summit of a hill, commands a view of the whole. The

skirts of the mountains are covered with oaks and a mixture of other wood, except where the naked pinnacle of rock shooting its head like a magnificent ruin through the trees, forms a contrast to the verdure of the foliage and fields: Which, with the sublimity of the surrounding mountains, gives an air of romantic grandeur, which few places enjoy.

Blair Drummond in Monteath is a very different place from these, although finished in the highest style: Removed from great mountains, the situation is less diversified, yet nature has been very kind: Between the two principal branches of the Forth, near their junction, in a plain of great extent and in the richest soil, with the rude majesty of the castle of Stirling, situated on a rock, in front, and the country behind rising with a gradual ascent towards the distant mountains. The north river is nearest the house; and along its banks avenues and plantations follow the course of the stream with horizontal lawns of some hundred acres, which are enlivened with dropping trees and sloping swells smooth and green. To these ornaments a counterpart is formed on the opposite side of the river by the huge mass of the castle of Doune, a monument of the power and jealousy of the Duke of Albany, who was an excellent regent but aspired to the sovereignty of his country, during the captivity of his nephew James the first. Blair Drummond is like an English place, in the manner of a park, whose diameter may be estimated at 12 furlongs, and in some directions more. On the south-west, the pleasure ground follows the Larch-bank, with obelisks and seats, and is ornamented with a vast variety of shrubbery and gravel walks, which humour the situation of the ground. On the lower side of this bank an artificial river, with islands and bridges, turns naturally along, till it lose itself among the trees. This place is a specimen of the
taste

taste of the author of the elements of criticism and of the gentleman farmer, whose plans are followed out and perfected by his son.

Cardross is in the heart of Monteath, on the verdant banks of the Forth, where it glides, slow, smooth and silent. The land is of the richest mould dressed down to the river's edge and carries the finest and closest grass. The trees are stately and vigorous, suited to the approach of a great place; many of them planted before the reformation, especially the planes which never turn a shoulder to the blast. The house has an air of antiquity, which gives a dignified appearance that spurns at minor criticisms on the irregularity of its parts. At one time it was certainly the first house in this country, and both without and within, still corresponds to the hospitality of the times, in which it was built.

Gartmore, on the confines of the county to the south west, is situated on a rising ground, and commands the whole view of that extensive vale, in which the Forth holds his course, which, in spite of Flanders moss, is one of the finest straths in Scotland. The south-gate is Gothic, suited to the grandeur of the northern mountains, which here present themselves to the eye. The north gate is more plain and beautiful, corresponding to the style of the adjacent ground, in that approach to the house. The fields to the south and east are well dressed. On the north and west, the surface is more rocky and barren; but in many places improved by trenching, and in others, covered with large and thriving plantations. The house, although built at different times, has the appearance of an original uniform plan and the apartments are finished with taste and elegance.

Kier is a magnificent looking place and commands a most extensive prospect, from Benlomond in Dunbarton-shire
down

down to the frith of Edinburgh. Situated on high ground and on the north-side of the vale formed by the Forth, it looks down on the rich and populous country, through which that river holds its course in links of incomparable beauty to the ocean. The varieties of wood and water, of hills and cultivated fields, of gentlemen's seats, of towns and villages enjoyed in this prospect it is impossible to describe. In a near view appears the bridge of Stirling, the nearest to the sea on the Forth; the castle of Stirling once the seat of royalty; the Abbey-Craig, where the undaunted Wallace encamped with his warriors and beat Surry in 1297; and Craig-Forth, with its tuft of trees; three insulated rocks, like so many ancient Pyramids rising out of the middle of the champaign country. About the house of Kier there may be 600 acres of dressed ground, with sloping banks and swelling hills, diversified with full grown trees and extensive plantations; exhibiting the taste for agriculture and embellishment of four successive proprietors, whose knowledge in these arts kept pace with the progressive improvement of the country.

The Castle of Lenrick rears its majestic head on the south bank of the Teath, with its turrets, battlements and embrasures, in a situation warmly sheltered and rurally picturesque. The air of antiquity, which the building exhibits, the lofty trees which surround it, vying with the altitude of the house, the magnificent river flowing through woods of native oak, which rolls its floods below and bounds the lawn on that side, and the variegated scenery of the approach along the sloping wooded margin of the tumultuous stream, with a distant view of the western Grampians, where Benledi raises its towering head to the clouds, all conspire to give an appearance of ancient grandeur and romantic simplicity to a place, where, notwithstanding all that the spirited proprietor

priëtor has already done, still an ample field remains to exercise his genius for agriculture and his taste for embellishment.

The Abbey of Culrofs and Valley-field, on the confines of Fife, enjoy the prospect of the fertile fields and seats of west Lothian on the opposite side of the coast: The trade from the German ocean to all the ports up the Frith and to Glasgow by the canal is carried on below their windows. Here the adventurous Genius of commerce is continually employed in exporting the manufactures and commodities of Scotland to foreign markets and importing those of distant nations, steering innumerable sails, braving every danger and ploughing on the bosom of the main.

The water of Devon is singular for its circuitous course, the deepness of the glen in which it flows from the Ochills and the wildness and altitude of its falls. After flowing 30 miles it returns to within 6 miles of its source, before it falls into the Forth. Between the church of Muckhart and that of Glendevon, its banks are uncommonly steep and picturesque, and the glen so narrow, that one can scarcely look down without giddiness: from which circumstance it derives its name*. Near the church of Dollar the rumbling bridge, which is 22 feet in span and 12 feet broad, is 86 feet above the bottom of the fall, at the head of which it is built. On opposite sides of the chasm a few shrubs and trees shoot out, from the crevices of the rugged cliffs. The water in its descent, dashing from rock to rock, is sometimes seen through the hanging trees. The deafening sound of the fall, the confused noise of the feathered tribes flying about, the steepness of the ground and the spray carried aloft by the winds gives to the whole a wildness mingled with horror seldom to be

met

* The deep glen.

met with. At the place called the Devil's mill, there is a fall of 14 feet, which used to make a clapping noise similar to that of a corn-mill; but has now ceased. The Cauldron linn is a mile below the rumbling bridge. The whole cascade is 88 feet. The linn is in the middle of the fall, where the boiling turbulence of the water dashing on the rocks below appalls the spectator. Immense pits of a cylindric form are worn in the solid granite by the continual friction of pebbles whirling round, upon which the water falls with a tremendous roar: Then the whole river is precipitated in one sheet from a height of above 40 feet upon blocks of stone, rushing, gushing, foaming, thundering down.

The Carse of Gowrie is a singular district. It is nearly in the form of a segment of a great circle, the Seedlaw hills forming the arc and the Tay the chord. This tract of country, which is now so rich and under such high cultivation, seems at one period to have been very much under water. In the remembrance of several persons alive, many parts were a morass, which are this day extensive fields of arable land. The river Tay is supposed to have formed a circuit round the Carse, washing the foot of the Seedlaw hills and entering the present channel at Invergowrie. Staples for holding cables have been found in the rocks at the bottom of these hills, on the north side of the flat land. The parish of St Madoes, which is now in the Carse of Gowrie is said to have been once on the Strathearn side of the river. Such parts of the Carse, as are elevated above the common level of the country are called *Inches* (which word signifies *islands*); this circumstance implying that all the flat land, was at one period not habitable, on account of water, either stagnant or flowing.

It is at least probable that the Tay may have had different mouths where it entered the sea, like the Danube, the Nile, the Rhine, and many other large rivers; that one of these flowed in the present channel, and another by the foot of the Seedlaws, which occasionally inundated the low lands.

The soil of these eminences in the Carse of Gowrie, called Inches, is not less different from that of the level country, than the names. The former like all the land on the south aspect of the Seedlaws being a red till, capable of high cultivation and in most places approaching to the nature of loam; the latter, like all land that had been immersed in water, being a blue clay, which is of a very rich quality when it is drained, exposed to the sun and pulverized.

Castle Huntly stands near the east end of the Carse, elevated on the summit of a rock which has a gentle ascent on the north east, but on the south west is 40 feet above the plain. James the II. granted to Lord Gray a charter in 1442, authorizing him to build here *Castellum de Huntly*, in honour of his lady, who was descended of the Huntly family. The Kingoody stone, which was used in the building, is said to have been carried by water to the foot of the wall, although the place is now about ten furlongs from the sea or any other water carriage. The rock itself seems to have been washed by the waves. The walls of the castle are ten feet thick; Athol house is the only castle, which I met with in the county, whose walls are of the same dimensions. This wall consists of three distinct parallel walls joined in one. The two external walls are built with more art; the wall betwixt these is composed of irregular rude blocks of stone, great and small, thrown in without order and cemented with liquid mortar. In one room 4 feet are scooped out of the inside wall on all the sides; so that the wall

of the room above projects 4 feet in every direction over the room below. In the year 1615 Lord Gray sold this estate to the Lyons of Glamis for 40,000 merks Scots; and in 1777 Mr Paterfon bought it for 40,000 l. str. from which it appears that property rose, during that interval, in the proportion of eighteen to one.

From the Copula of Castle Huntly, the prospect is extensive, pleasant, diversified and grand beyond description: The whole Frith of Tay, with the continual navigation upon it, the opposite coast of Fife, and all the district of Gowrie, that favoured spot in the very lap of nature, with their towns and villages; the elegant mansions of proprietors, with their beautiful lawns and extensive plantations; rich farms and their snug steadings fields; laden with the heaviest crops, pastures abounding with cattle, the most luxuriant soil smoking under the genial rays of the sun and sheltered from the baneful breath of the northern blast by an amphitheatre of hills, which are either cultivated to their tops or covered with flocks white as snow.

If any person continues to give credit to Dr. Johnson's illiberal account of Scots trees, which has been founded in ignorance, dictated by prejudice and written with gall, let him take a view of the trees of the places already mentioned in this report and of many others in the county, which ought to have been taken notice of, were it not for fear of appearing prolix. Let him take a view of Castle Huntly and say, if he can, that there are no trees in Scotland. At this place alone there are ashes, whose trunk is from 27 to 19 feet in circumference; elms 11; horse chesnuts 10; poplars 10; planes 9; firs from 13 to 9; and some at the root of the trunk, 19. Ews 6, thorns 6, limes between 7 and 8. The diameter of the top of one fir tree is 66 feet. Inferi-

or planes have been sold at between 13 and 14 l. each; and firs have been cut which contained 90 feet of wood below the boughs.

At Monzie near Crieff there are larches, not above 60 years of age, 16 feet in girth, and between 80 and 90 feet high. The diameter of the span of the branches 60 feet.

At Kippenrofs near Dunblane, there are some large trees. the greatest of the planes is 27 feet in circumference at the bottom, and where it branches 30 feet.

At Athol house, at Taymouth, at Drummond Castle, at Rossie, at Gleneagles, Aberuchil, Finlarig, Castle Menzies, little Dunkeld, Lenrick, Lawers, Edinample and several other places are many great trees of various kinds; but having neglected to take down the dimensions in my notes, it would be improper to guess at their size.

Besides Castle Huntly, there are many other stately mansions in the Carse of Gowrie, which must strike the eye and attract the attention of every traveller. The elegance of the buildings, the taste with which the ground is laid out, ornamented with gardens and orchards, besides the general beauty of the country, evince both the judgment and opulence of the proprietors. The operations at Milnfield, at Mury, at Ballendean and other places must be referred to the agricultural part of this report.

The extensive castle now building at Pitfour, which commands a near view of the Frith of Tay with all the shipping below the windows, and of the opposite coast of Fife, with the villages and seats on both sides of the river, and a south-west view far up the Earn, towards the fine country about Abernethy, of the towering hill of Kinnoul to the north and of Kinfauns at the foot of that hill, will soon be a noted

place; a specimen of the effects of industry, of a genius for trade, and of the taste of the proprietor.

Belmont Castle, on the eastern frontier of this county is a magnificent place; and next to Glamis is the ornament of Strathmore. The house is large, elegant and commodious; the fields around dressed in the highest style, the trees aged, thriving and numerous. The observatory, erected by the present proprietor in a lawn near the house, denotes an enlightened mind and an elevated train of thinking, which, although ornamental to human nature and friendly to the sciences, cannot be gratified in its full extent, except by persons of opulent fortunes.

The house of Arthursstone and that of St Martins are spacious, elegant modern buildings: and by the time that the proprietors have had time to ornament their fields in the same style they have followed in the architecture of their dwellings, both places will be esteemed by posterity as specimens of the taste displayed in the latter end of the 18th century.

The palace of Scone, venerable to every Scotsman as the seat of royalty, where the monarchs of that kingdom were crowned on the marble chair coeval with the monarchy itself, is situated on the banks of the Tay two miles above Perth. It was impossible for me to see the inside, because the house-keeper was absent, but the fabrick has an air of antiquity which pleases, makes one forget its irregularity, owing to the additions made in different ages, and strikes a man of sentiment with awe, from the recollection of the heroes who trod this *almost sacred* ground, in the days of the years that are past. The declining bank in front of the palace is covered with a rich carpet of grass, for half a mile, down to the river-edge. The park extends to a
considerable

considerable distance on the right and on the left, which is ornamented with dropping trees of the most magnificent and vigour appearance. The majestic river, which made the Roman foldiers cry out *ecce Tiberim*, washes the south border of the lawn, in its course to the bridge of Perth; under which it flows through nine arches, elegant for their symmetry, their beauty and the lightness of their appearance. On the south banks of the river, the Inch which is the pleasure ground of the inhabitants, the rich farms towards Tullybelton, and Huntingtower a feat of the duke of Athol, vary and extend the prospect, which is bounded by large plantations behind the county-town and a distant view of the Ochills over the trees. On the right the wood and and castle of Methven, and the river Almond with bleach-fields on every side, flowing into the Tay above Scone, ornament this princely place, which itself reflects dignity on every spot within its view.

Many other places in this extensive county are deserving of notice, for their antiquity, or their elegance, or their situation, or the plantations around them, or the taste discovered in dressing their fields; Murthly on the west bank of the Tay below Dunkeld would merit description, for the beauty of the situation, and the extensive and rich scenery of which it commands the prospect; Ruthven bank, where the Isla winds about and assumes a westerly course; Mickleure in the angular point, where the Tay receives the waters of the Isla; from which circumstance it derives its name; Blairgowrie, a fine modern building, on the side of the Ericht, with a great extent of planting on the south and west, and a rising bank of the richest soil on the north; Delvin, on a rich elevated plain of 160 acres, regularly steep on every side, and raised 60 feet above the level of the adjacent

jacent country, which seems both from its ancient name (Inchtuthil, *the island of floods*) and the appearance of the ground, to have been once an island in the Tay; Stobhall on the banks of the Tay, where the whole waters of the river rush over a ledge of rock at the Linn of Campsie, the greatest cascade on all the Tay; Faskaly, a most romantic situation at the conflux of the Gary and Tumil near Killcrankie; Logie Almond, on the finely wooded banks of that river, where the beauty of the fields form a contrast to the surrounding mountains; Balgowan, on the western bow, where the policy is extensive, alternately covered with clumps of trees, hedge rows and rich land, improved according to a system which does honour to the understanding and activity of the proprietor; Monzie, remarkable for its snugness and warmth and the size of its larches; * Castle Menzies in the heart of a rich country, well sheltered by art and nature, having the river Tay in full view and the first bridge built across that river, a monument of the attention of government to the good of the public; Kinfauns on the south base of the Seedlaws, having a most extensive prospect of the Frith, and of all the Carse of Gowrie, where the luxuriance of nature is aided and directed by the industry and skill of man; Megginch Castle, situated on a rising ground, as the name denotes, whose tall trees and straight avenues and venerable buildings put the traveller in mind of the last age; Rednock house in Monteath, where the soil is uncommonly rich, having carried 14 successive white crops without any manure and without the least appearance of being exhausted; Here is the most elegant and the most compleat steading of offices in that part at least of the country;

* Since this Survey was made an elegant house is building at Monzie.

ty ; Cambusmore near Callander, where every species of improvement in land is carried on with spirit and success ; The ancient castle of Kilbride with its romantic glen, its hanging garden, and the wildly wooded banks of the Ardoch, where it pours its noisy torrents from the northern hills ; Kippenrofs on the banks of the Allan, where the river is finely wooded, and the glen most picturesque, and some of the largest trees in this country ; Ardoch farther up the Allan, where extensive plantations rear their heads to correct the influence of the climate and ornament the country ; The castle of Braco, where every thing has been done in planting, building and dressing the ground, that man could do to remedy the bleakness and inconvenience of an exposed situation ; Invermay, with its green banks and thriving woods, commanding a full view of the Earn for many miles and of all the seats upon its sides ; The natural beauties of this place have given occasion to one of the sweetest airs in the Scots music ; Moncrieff-house under covert of the hill of that name, which will soon be wooded to the top, having the vale of Abernethy and the lower links of the Earn in full view, the environs dressed in a superior style and basking under the meridian sun.

However I may regret that some places may have been overlooked, which ought to have been taken notice of in a description of this important county, yet under a consciousness of having exceeded the limits at first intended for this article, it is time to draw it to a close.

No. 2.

*AN ACCOUNT OF THE MOSS OF KINCARDINE.**Preface.*

THE following full and accurate account of the Moss of KINCARDINE, must no doubt be acceptable and useful to the public; as it describes the rise and progress of the most singular and considerable piece of improvement that has been executed in any parish in Scotland.

There is probably no tract of land of the same extent, equally unprofitable and useless, that has ever been rendered so productive and populous, in any part of the three kingdoms. As there are extensive tracts of waste land similar to the Moss of Kincardine, both in Britain and Ireland; the successful improvement here described, well deserves to be generally known and pursued. Whatever advantage accrues from it to the proprietor is meritoriously obtained, as by this practice the produce of the country in corn and cattle is enlarged; the country itself is rendered more populous; and the lowest of the people not only find beneficial employment, but it affords motives to excite them to the exertion of the most vigorous and useful industry.

A large number of settlers in the Moss of Kincardine were people of the lowest rank in the Highlands, expelled from their native residence in consequence of the extensive sheep farms which have been established of late. Had opportunity offered, they would have removed to America. Fortunately, however, they have here found, not only an asylum, but a comfortable settlement, in which they are usefully employed for themselves and with great benefit to
their

their country. Were this mode of reclaiming waste land, adopted by the great proprietors in the Highlands they would not only retain their people, but by retaining them would augment the value of their property and stop all emigration to America, which, without this or some other effectual remedy, will not be prevented.

This extraordinary piece of improvement, took its rise from the inventive genius, and patriotic views of the late Lord Kames! and has been conducted and brought to perfection by his son in a liberal and judicious manner. But though it had no precedent, it is surprising, that from the experience of its utility, it should not as yet have been followed as an example, by any other proprietor. In Moss Tlanders which is adjacent, there are near 10,000 acres perfectly similar, but which have greater advantages, with respect to water than the moss of Kincardine.

It is urged by some landholders, who have extensive mosses upon their estates, that the subsoil in Kincardine moss is a clay of a very rich quality, and peculiarly favourable for this method of improvement. But the very same clay is to be found in the bottom of many of our mosses in Scotland. Most of our extensive mosses are bottomed by clay, or a mixture of clay and sand, which, with a proportion of peat earth, forms a most improveable soil. Wherever timber is found in a moss, it must have grown on the soil at the bottom; and wherever large trees have grown, on a plain or in a valley, there must remain a soil well worth the cultivation. It will be observed in the perusal of this paper, that the great obstacle to the undertaking, was the want of a sufficient command of water, which occasioned a considerable expence. But in many of our mosses in Scotland, there

is no such obstacle, and consequently all such expence will be avoided.

The most important part of this plan, is the nature of the tenure, by which the people who improve the moss, are to hold their possessions. In whatever way our mosses are to be reduced to culture, it will be found that this sort of tenure or something similar to it, is the most effectual means to attain the end.

Account of the Moss.

THE moss of Kincardine is situated in the parish of the same name, comprehended between the rivers Forth and Teith, and in that district of Perthshire called *Monteith*. The moss begins about a mile above the confluence of these rivers; from thence it extends in length about four miles, and from one to two in breadth; and before the commencement of the operations (an account of which is to be given,) comprehended near 2000 Scotch acres, of which about 1500 belong to the estate of Blair Drummond, the property of Lord Kames by his marriage with Mrs Drummond of Blair Drummond.

As mosses are extremely various in their nature; before entering upon the improvements made in Kincardine moss, it will be proper to give a short description of that moss, and of the subjacent soil which is the object of those improvements.

The moss lies upon a field of clay, which is a continuation of those rich, extensive flats in the neighbourhood of Falkirk and Stirling, distinguished by the name of *carfes*. This clay, which is of a uniform homogenous mass sinking to a great depth, is found near the surface, consists of different colours, and is disposed in layers. The uppermost is grey;
the

the next is reddish; and the lowest, which is the most fertile, is blue. Through the whole mass not a pebble is to be found. The only extraneous bodies it contains are sea-shells, which occur in all the varieties peculiar to the eastern coast of Scotland. They are disposed sometimes in beds, sometimes scattered irregularly at different depths. By attending to these circumstances, it cannot be doubted that the sea has been the means of the whole accumulation, and that it was carried on in a gradual manner by the ordinary ebb and flow of the tide. Upon any other supposition, why should there not have been a congeries of all the different materials that compose the surface of the surrounding heights? But to whatever cause the origin of this accumulation may be ascribed, certain it is that no soil whatever is more favourable to vegetation, or carries more abundant crops of every kind.

The surface of the clay, which, upon the retreat of the sea, had been left in an almost level plane, is every where thickly covered with trees, chiefly oak and birch, many of a great size. These trees seem to have been the first remarkable produce of the earth; and it is probable they were propagated by dissemination from the surrounding eminences. They are found lying in all directions beside their roots, which still continue firm in the ground in their natural position; and from impressions still visible, it is evident they have been cut with an axe or some similar instrument. For the cutting of wood, the two common purposes are, either to apply it to its proper use, or that the ground it occupies may be cultivated. In the present case, however, neither of these ends had been proposed, since the trees, by being left just as they were cut, were not only entirely lost, but the ground was rendered totally unfit for cultivation. Hence it

is evident, that the downfall of this wood must be ascribed to some more extraordinary cause; and to none more probably than to that expedient, which, as we learn from Dion Cassius and other historians, the Romans put so extensively in practice to dislodge from their forests the ancient inhabitants of the British islands.

This hypothesis acquires no small degree of force from a circumstance that occurred in May 1768, when a large round vessel of thin brass and curious workmanship, 25 inches in diameter and 16 inches in height, was discovered upon the surface of the clay buried under the moss. This vessel, found upon the estate of John Ramsay, Esq. of Ochtertyre, was by that gentleman presented to the Antiquarian Society of Edinburgh; in whose museum it remains deposited for preservation. And in a list of the various donations presented to that society, published by them in 1782, it is there denominated a *Roman camp-kettle*.

Between the clay and the moss is found a stratum nine inches thick, partly dark brown and partly of a colour approaching to black. This is a vegetable mould, accumulated probably by the plants that covered the ground previous to the growth of the wood, and by leaves from the trees thereafter. The difference of colour must be owing to a difference in the vegetable substances that compose it. The brown mould is highly fertile; the other, especially in a dry season, is very unproductive. The crop that had occupied this mould when the trees were felled is found still entire. It consists chiefly of heath; but several other smaller plants are also very distinguishable.

Immediately above this stratum lies the moss, to the height, upon an average, of seven feet. It is composed of different vegetables arranged in three distinct strata. Of these the first

first is three feet thick. It is black and heavy, and preferable to the others for the purpose of fuel. It consists of bent-grass (*agrostis*) which seems to have grown up luxuriantly among the trees after they were felled. The second stratum also is three feet thick. It is composed of various kinds of mosses, but principally of bog-moss (*sphagnum*). It is of a fallow or iron-colour, remarkably elastic; It is commonly called *white-peat*; and for fuel is considered as much inferior to that above mentioned. The third stratum is composed of heath and a little bent-grass, but chiefly of the deciduous parts of the former. It is about a foot thick, and black.

Three strata of different vegetables lying above each other, the limits of each distinctly marked, and each distinguished by a different colour, is certainly a curious natural phenomenon.

An inquiry will here occur, What has occasioned this succession in the vegetables of which the moss is composed?

Every vegetable has a particular soil, more or less moist, peculiarly adapted to its nature. Let a piece of ground be in a moist state, rushes will introduce themselves; drain the ground sufficiently, the rushes will disappear, and finer vegetables will succeed. It seems reasonable to account for the succession of the different plants that compose the moss on similar principles.

Let us imagine an extensive plain covered with trees lying in all directions, full of branches, and possibly loaded with leaves. This it is evident would produce a great stagnation of water, which, as the crop of bent-grass accumulated, would still increase: and the probability is, that at length it had so increased, as to be the cause why the bent-grass and other congenial plants of the first stratum ceased to grow.

But

But it is evident that a plant was to be found that could live in such a situation. Accordingly we see that bog-moss had established itself; a plant that loves even to swim in water.

When the accumulations of bent-grass and the mosses had, in process of time, arisen to the height of six feet above the surrounding *carfe* ground, the water that fell upon the surface had by that means an opportunity to discharge itself. It has accordingly formed many channels, which are often three feet deep; and the intermediate surface being wholly turned into little hillocks has become dry and firm. By this means it became unfit for mosses, and heath succeeded.

Such seems to have been the process in the formation of what is now called *a moss*.

By far the greatest part of the moss in question is, upon an average, full seven feet deep, and has in all probability lain undisturbed since its formation: this is called the *High Moss*. The remainder, called the *Low Moss*, lies to a considerable breadth around the extremities of the high; and is, upon an average, not above three feet in depth, to which it has been reduced by the digging of peats. These are formed of that stratum of the moss only that lies four feet below the surface and downwards; the rest is improper for the purpose, and is thrown aside.

Before the introduction of the plan which is now pursued, two methods chiefly were employed to gain land from the moss. 1st, The surrounding farmers marked off yearly a portion of the Low Moss next to their arable land, about 15 feet broad. This they removed with carts and spread upon their fields, some acres of which they for that end left unfown. Here it lay till May or June; when, being thoroughly dry, it was burnt to ashes to serve as a manure. By this means they added to their farms about half a rood of
land

land yearly. But this plan proved unsuccessful; for by the repeated application of these ashes, the soil was rendered so loose that the crops generally failed. 2dly, Many farmers were wont to *trench down* the low mofs, and to cover it *furrow deep*, with clay taken out of the trench. This, though commendable as an attempt to improve, proved likewise an unavailing method; because in a dry season the superficial covering of clay retains so little moisture that the crop commonly fails.

It has been attempted to cover the mofs with clay brought from the adjacent grounds. But what from the necessary impoverishment of the ground from which the clay was carried, and the softness of the mofs, this was soon found to be impracticable.

Draining has also been proposed as another mode of improvement; and it must be acknowledged, that, by means of draining, many mosses have been converted both into arable and meadow grounds, which in the end became interesting improvements. But in a moss, such as that of Kincardine, this method would be ineffectual; as for several feet deep it is of such a nature, that upon being dry and divided into parts, it would blow with the wind like chaff; and when thrown aside in the operation of digging peats, it lies for years without producing a single vegetable, except only a few plants of sorrel.

Hence it is evident, that all attempts to *improve* this moss must ever prove abortive; and that the object to be had in view is the acquisition of the valuable soil lying underneath; to which end nothing less is requisite than the total abolition of the moss.

By the methods above described from 100 to 200 acres of moss had been removed. When the present plan was introduced,

duced, there still remained covered with moss from 1300 to 1400 acres of carse clay—a treasure for which it must be ever interesting to dig.

In the year 1766 Lord Kames entered into possession of the estate of Blair Drummond. Long before that period he was well acquainted with the moss, and often lamented that no attempt had ever been made to turn it to advantage. Many different plans were now proposed; at length it was resolved to attempt, by means of water as the most powerful agent, entirely to sweep off the whole body of moss.

That moss might be floated in water, was abundantly obvious; but to find water in sufficient quantity was difficult, the only stream at hand being employed to turn a corn-mill. Convinced of the superiour consequence of dedicating this stream to the purpose of floating off the moss, Lord Kames having made an agreement with the tenant who farmed the mill, and the tenants thirled consenting to pay the rent, he immediately threw down the mill, and applied the water to the above purpose.

In order to determine the best manner of conducting the operation, workmen were now employed for a considerable time upon the Low Moss both by the day and by the piece, to ascertain the expence for which a given quantity of moss could be removed. It was then agreed to operate at a certain rate per acre; and in this manner several acres were removed.

But this was to be a very expensive process. The ground gained might, indeed, be afterwards let to tenants; but every acre would require an expenditure from 12 l. to 15 l. before it could be ready for sowing; so that the acquisition of the whole, computing it at a medium to be 1350 acres, would sink a capital of nearly 20,000 l. Sterling.

One

One other method still remained; namely, to attempt letting portions of the moss, as it lay, for a term of years sufficient to indemnify tenants for the expences incurred in removing it. For some time both these plans were adopted; but several reasons made the latter preferable. 1. The quantity of water to be had was small; and being also uncertain, it was very inconvenient for an undertaker; neither were there any houses near the spot, which occasioned a great loss of time in going and coming: but when a man should live upon the spot, then he could be ready to seize every opportunity. 2. The moss was an useless waste. To let it to tenants would increase the population of the estate, and afford to a number of industrious people the means of making to themselves a comfortable livelihood.

In the mean time it was determined, till as many tenants should be got as could occupy the whole water, to carry on the work by means of undertakers.

But before proceeding farther it will be necessary to describe the manner of applying water to the purpose of floating the moss.

A stream of water sufficient to turn a common corn-mill will carry off as much moss as 20 men can throw into it, provided they be stationed at the distance of 100 yards from each other. The first step is to make in the clay, along-side of the moss, a drain to convey the water: and for this operation the carse-clay below the moss is peculiarly favourable, being perfectly free from stones and all other extraneous substances, and at the same time, when moist, slippery as soap; so that not only is it easily dug, but its lubricity greatly facilitates the progress of the water when loaded with moss. The dimensions proper for the drain are found to be two feet for the breadth and the same for the

R r r

depth.

depth. If smaller, it could not conveniently receive the spadefuls of moss; if larger, the water would escape, leaving the moss behind. The drain has an inclination of one foot in 100 yards: the more regularly this inclination is observed throughout, the less will the moss be liable to obstructions in its progress with the water. The drain being formed, the operator marks off to a convenient extent alongside of it a section of moss 10 feet broad; the greatest distance from which he can heave his spadeful into the drain. This he repeatedly does till the entire mass be removed down to the clay. He then digs a new drain at the foot of the moss-bank, turns the water into it, and proceeds as before, leaving the moss to pursue its course into the river Forth, a receptacle equally convenient and capacious; upon the fortunate situation of which, happily forming for several miles the southern boundary of the estate, without the interposition of any neighbouring proprietor, depended the very existence of the whole operations.

When the moss is entirely removed, the clay is found to be encumbered with the roots of different kinds of trees standing in it as they grew, often very large: their trunks also are frequently found lying beside them. All these the tenants remove often with great labour. In the course of their operations they purposely leave upon the clay a stratum of moss six inches thick. This, in spring, when the season offers, they reduce to ashes, which in a great measure ensures the first crop. The ground thus cleared is turned over, where the dryness admits, with a plough, and, where too soft, with a spade. A month's exposure to the sun, wind, and frost, reduces the clay to a powder fitting it for the seed in March and April. A crop of oats is the first,
which

which seldom fails of being plentiful, yielding from eight to ten bolls after one.

In the year 1767 an agreement was made with one tenant for a portion of the Low Mofs. This, as being the first step towards the intended plan, was then viewed as a considerable acquisition. The same terms agreed upon with this tenant have ever since been observed with all the rest. They are as follow :

The tenant holds eight acres of mofs by a tack of 38 years; he is allowed a proper quantity of timber, and two bolls of oatmeal to support him while employed in rearing a house; the first seven years he pays no rent; the eighth year he pays one merk Scots; the ninth year two merks; and so on with the addition of one merk yearly till the end of the first 19 years; during the last five years of which he also pays a hen yearly. Upon the commencement of the second 19 years, he begins to pay a yearly rent of 12s. for each acre of land cleared from mofs, and 2s. 6d. for each acre not cleared, also two hens yearly: A low rent indeed for so fine a soil; but no more than a proper reward for his laborious exertions acquiring it.

In the year 1768 another tenant was settled. These two were tradesmen; to whom the preference was always given, as having this great advantage to recommend them, that even when deprived of water they need never want employment. The motives that induced these people to become settlers were, 1st, The prospect of an independent establishment for a number of years. 2^{dly}, The mofs afforded them great abundance of excellent fuel; to which was added the comfortable consideration, that, while busied in providing that necessary article, they had the double advantage of pro-

noting, at the same time, the principal object of their settlement.

Notwithstanding these inducements, still settlers offered slowly; to which two circumstances chiefly contributed: 1st. The whole farmers surrounding the mofs threw every possible obstruction in their way. 2^{dly}. By people of all denominations the scheme was viewed as a chimerical project, and became a common topic of ridicule. The plan, however, supported itself; and in the year 1769 five more tenants agreed for eight acres each; and thus 56 acres of Low Mofs were disposed of. From the progress made by the first settlers, and the addition of these, the obloquy of becoming a mofs-tenant gradually became less regarded; so that in the year 1772 two more were added; in 1773, three; and in 1774, one; in all 13: which disposed of 104 acres; all the Low Mofs to which water could then be conveyed. As water is the main spring of the operation, every tenant, beside the attention necessary to his share of the principal stream, collected water by every possible means, making ditches round his portion of the mofs, and a reservoir therein to retain it till wanted.

The tenants in the Low Mofs having now begun to raise good crops, in the year 1774 several persons offered to take possessions in the High Mofs, upon condition that access to it should be rendered practicable. The High Mofs wanted many advantages that the Low possessed. To the Low Mofs, lying contiguous to the surrounding arable lands the access was tolerably good; but from the arable lands the High Mofs was separated by 300 or 400 yards of the Low, which, even to a man, affords but indifferent footing, and to horses is altogether impracticable. The Low Mofs is in general
only

only three feet deep; the High Mofs is from fix to twelve feet in depth.

It will appear at first fight, that without a road of communication the High Mofs must for ever have proved unconquerable. Without delay, therefore, a road was opened to the breadth of twelve feet, for several hundred yards in length, by floating off the mofs down to the clay.

This being effected, and at the same time an opening given to admit water, in the year 1775 twelve tenants agreed for eight acres of High Mofs each. In consideration of the greater depth of this part of the mofs, it was agreed, that during the first 19 years they should pay no rent; but for the second 19 years the terms of agreement were the same as those made with the tenants in the Low Mofs. To the above mentioned tenants every degree of encouragement was given; as upon their success depended, in a great measure, the disposal of the great quantity of mofs still remaining. But their success, however problematical, was such, that next year,

1776, 6 more took 8 acres each,

1777, 1

1778, 4

1779, 3

1780, 1

1781, 1

1782, 1

In all, including those upon the Low Mofs, 42 tenants, occupying 336 acres.

Though for some time the disposal of the High Mofs went but slowly on, it was not for want of tenants; but the number of operators were already sufficient for the quantity of
water;

water; to have added more, would evidently have been imprudent.

In the year 1783 Mr Drummond entered into possession of the estate of Blair-Drummond, and went fully into the plan adopted by his predecessor for subduing the mofs. At this time there still remained undisposed of about 1000 acres of High Mofs. As water was the great desideratum, it was determined, that to obtain that necessary article neither pains nor expence should be wanting. Steps were accordingly taken to ascertain in what manner it might be procured to most advantage.

Meanwhile, to prepare for new tenants a second road parallel to the former, at the distance of half a mile, was immediately begun and cut, with what water could be got, down to the clay, 12 feet broad, and 2670 yards long, quite across the mofs. This opening was previously necessary, that operators might get a drain formed in the clay to direct the water; and it was to remain as a road that was absolutely necessary, and which relieved settlers from an expence they were unable to support. These preparations, the progress of the former tenants, and the prospect of a farther supply of water, induced 10 more to take possessions in the year 1783; in the year 1784, 18 more took possessions; and in 1785 no fewer than 27;—in all, 55 tenants in three years, which disposed of 440 acres more of the High Mofs.

As the introduction of an additional stream to the mofs was to be a work both of nicety and expence, it was necessary to proceed with caution. For this reason several engineers were employed to make surveys and plans of the different modes by which it might be procured. In one point they all agreed, that the proper source for furnishing that supply was the river Teith; a large and copious stream that
passes

passes within a mile of the mofs: but various modes were proposed for effecting that purpose.

To carry a stream from the river by a cut or canal into the mofs was found to be impracticable; and Mr Whitworth* gave in a plan of a pumping machine, which he was of opinion would answer the purpose extremely well.

Soon after this Mr George Meikle of Alloa, a very skilful and ingenious mill-wright, gave in a model of a wheel for raising water, entirely of a new construction, of his own and his father's invention jointly. This machine is so exceedingly simple, and acts in a manner so easy, natural, and uniform, that a common observer is apt to undervalue the invention: But persons skilled in mechanics view machinery with a very different eye; for to them simplicity is the first recommendation a machine can possess. Accordingly, upon seeing the model set to work, Mr Whitworth, with that candour and liberality of mind that generally accompany genius and knowledge, not only gave it the greatest praise, but declared that, for the purpose required, it was superior to the machine recommended by himself, and advised it to be adopted without hesitation.

The better to explain this machine, two sketches are annexed, to the first of which the following letters refer. The explanation of the second will be found upon the sketch.

a. Sluice through which is admitted the water that moves the wheel.

b, b. Two sluices through which is admitted the water raised by the wheel.

c, c. A

* This gentleman is superintendant of the London water works, and an engineer of great reputation in England. He was several years employed in Scotland in completing the great canal.

c, c. A part of one of two wooden troughs and an aperture in the wall, through which the above water is conveyed into the buckets. [The other trough is hid by two stone walls that support the wheel.]

d, d, d. Buckets, of which 80 are arranged on each side of the arms of the wheel = 160.

e, e, e. A cistern, into which the water raised by the buckets is discharged.

f, f, f. Wooden barrel-pipes, through which the water descends from the cistern under ground, to avoid the high road from Stirling and the private approach to the house.

Sketch second contains a plan of the cistern, and exhibits the manner in which the water is filled into the buckets.

The diameter of the wheel to the extremities of the float-boards is 28 feet; the length of the float-boards, 10 feet. The wheel makes nearly four revolutions *per* minute; in which time it discharges into the cistern 40 hogheads of water. But this is not all the wheel is capable of performing; for by several accurate trials by Messrs Whitworth and Meikle, in the result of which, though made separately, they perfectly agreed, it was found that the wheel was able to lift no less than 60 hogheads *per* minute; but that the diameter of the pipes through which the water descends from the cistern would not admit a greater quantity than what they already receive.

To a person at all conversant in hydraulics, the resemblance of this to the Persian wheel must be obvious: and indeed it is probable, that from the Persian wheel the first idea of this machine was derived. But admitting this, still the superiority of the present wheel is, in most respects, so conspicuous, as to entitle it to little less praise than the first invention. For, 1st, In the Persian wheel, the buckets being

ing all moveable, must be constantly going out of order : In this wheel they are all immoveable, consequently never can be out of order. 2dly, Instead of lifting the water from the bottom of the fall as in the Persian wheel, this wheel lifts it from the top of the fall, being from four to five feet higher ; by which means some additional power is gained. 3dly, By means of the three sluices (*a*, and *b*, *b*, fig. 1.) in whatever situation the river may be, the quantity of water to be raised is so nicely adjusted to that of the moving power, as constantly to preserve the wheel in a steady and equable motion. In short, as a regulator is to a watch, so are these sluices to this wheel, whose movements would otherwise be so various, as sometimes to carry the water clear over the cistern, sometimes to drop it entirely behind, but seldom so as fully to discharge the whole contents of the buckets into the cistern.

It is however but candid to remark, that this machine labours under a small defect, which did not escape the observation of Mr Whitworth ; namely, that by raising the water about $3\frac{1}{2}$ feet higher than the cistern where it is ultimately delivered, a small degree of power is lost. To this indeed he proposed a remedy ; but candidly confessed, that as it would render the machine somewhat more complex, and would also increase the friction, he thought it more advisable to keep it in its present state. At the same time he justly observed, that as the stream by which the wheel is at all times copious and powerful, the small loss of power occasioned by the above circumstances was of little or no avail.

This stream is detached from the Teith at the place where that river approaches nearest to the moss. The surface of the latter is about 15 feet higher than that of the former ;

the cistern is therefore placed 17 feet above the surface of the stream, so as to leave a declivity sufficient to deliver the water upon the surface of the moss.

The pipes through which the water descends from the cistern are composed of wooden barrels hooped with iron 4 feet long and 18 inches in diameter within.

In these pipes, having been conveyed under ground for 354 yards from the cistern, the water at once emerges into an open aqueduct. This aqueduct, which was formed according to a plan by Mr Whitworth, is constructed wholly of earth or clay: and in order to keep the water on a level with the surface of the moss, it is for nearly two-thirds of its course elevated from 8 to 10 feet above the level of the adjacent grounds; the base being 40 feet broad, the summit 18 feet, and the water course 10 feet broad. It commences at the termination of the pipes; from whence extending above 1400 yards, it discharges the water into a canal formed for its reception on the surface of the moss.

For raising the water to this height there were two reasons. 1st, That not only where it was delivered on the moss, but even after being conveyed to the most distant corners, it might still retain sufficient power to transport the moss to the river Forth. 2dly, That reservoirs of a sufficient height might be formed in the moss to retain the water delivered during night.

In consequence of Mr Whitworth's advice, a contract was entered into with Mr Meikle in spring 1787; and by the end of October in that year, the wheel, pipes, and aqueduct, were all completely finished: and what, in so complex and extensive an undertaking, is by no means common, the different branches of the work were so completely executed, and so happily adjusted to each other, that upon trial the ef-

fect answered the most sanguine expectations. The total expence exceeded L.1000 Sterling.

To induce the proprietor to embark in this undertaking, the moss tenants had of their own accord previously come under a formal engagement to pay the interest of any sum that might be expended in procuring a supply of water. But he was determined they should not enjoy by halves the sweets of this long wished for acquisition. With a view, therefore, not only to reward their past industry, but to rouse them to future exertions, he at one set them free from their engagement; nor has any interest ever been demanded.

This new supply was a most acceptable boon to the moss tenants.—In order to make an equitable distribution, the water raised through the day was allotted to one division of operators; that raised during the night to another. To retain the latter, a canal was formed, extending almost three miles through the centre of the moss. From place to place along the sides are inserted sluices to admit water to the reservoirs of the possessors; each sluice having an aperture proportioned to the number of operators to be supplied from the reservoir which it fills. For the water raised through the day in reservoirs are necessary; as it is immediately used by the division to which it is allotted.

This additional stream, though highly beneficial, yet is not more than sufficient to keep 40 men at constant work. But such a quantity as would give constant work is not necessary; the operators must be often employed in making and repairing their drains, grubbing up roots of trees, &c. so that a quantity sufficient to give five or six hours work *per* day to the whole inhabitants is as much as would be wanted. But as the quantity procured was still insufficient

for this purpose, a small stream that descended from the higher grounds was diverted from its course and brought into the moss. From want of level this stream could not be delivered to the greatest advantage; namely, upon the surface of the moss. Yet by making, at a considerable expence, a drain half a mile long, and a reservoir for the night-water, it was rendered of much importance. And during the whole winter months, as well as in summer, after every fall of rain, it keeps 15 persons fully employed.

In the year 1787 two more tenants agreed for eight acres each; in 1788, four; in 1789, eight; in 1790, four tenants, all agreed for the same number of acres.

The whole moss was now disposed of, except that part called *Flow-moss*, which comprehended about 400 acres. Here it is twice the usual breadth, so fluid that a pole may be thrust with one hand to the bottom; and the interior part, for near a mile broad, is three feet above the level of all the rest of the moss. Hitherto the many and various difficulties that presented themselves had been overcome by perseverance and expence. But here the extraordinary elevation of the morass, joined to its great fluidity, seemed to exclude all possibility of admitting a stream of water; and it was the general opinion that the moss-operations had now arrived at their *neplus ultra*, and that this morass was doomed to remain a nuisance for ages to come.

But the proprietor had now advanced so far that he could not submit to retreat; and he considered himself as, in some measure, pledged to the country for the completion of this undertaking. To detail the various methods practised to introduce a stream of water into that morass, would prove tedious. It is sufficient to say, that after a thousand unsuccessful efforts, attended with much trouble

and

and considerable expence, the point at last was gained, and a stream of water was brought in, and carried fairly across the centre of the morafs.

The greatest obstacle was now indeed overcome; but still another remained of no small moment, namely, the discouragement given to settlers from the total impossibility of erecting habitations upon the surface of this morafs. To find a remedy for this evil was difficult. Happily a resource at last occurred. This was to bargain with a certain number of the old tenants whose habitations were nearest, to take leases of portions of the morafs. But as some additional aid was here necessary, it was agreed that L. 12. Sterling should be gradually advanced to each tenant till he should accomplish the clearing of an acre, for which he or his successor is bound to pay 12s. of yearly rent, equal to five *per cent* upon the sum advanced. When this point shall be gained, they are bound to dispose, as most agreeable to themselves, either of their old or of their new possession; for which, when once an acre is cleared, purchasers will not be wanting.

In consequence of the above arrangement, during the year 1791 no fewer than 35 of the old tenants agreed, upon the forefaid conditions, for eight acres each of the Flow-mofs. Thus 1200 acres are now disposed of to 140 tenants. But when these 35 tenants shall each have cleared their acre, then, according to agreement, 35 additional tenants will speedily be acquired; and the mofs will then contain in all 150 families.

To the leases already granted to the tenants in the High Mofs, it is now determined to add a further period of 19 years (making in all 57 years), during which they are to pay one guinea per acre; a rent not greater than the land is worth even at present, but greatly below its probable value

at

at that distant period. This, it is hoped, will prove to the tenants a sufficient incitement to continue their operations till their possessions are completely cleared from mofs.

Having now gone through, in detail, the whole progress of the colony since its first settlement in the year 1767, it still remains to take a general view of the effects produced by that establishment.

For several years, at first, the water was used chiefly to carry off mofs, in the forming of new roads, and preparing reservoirs; which considerably retarded the principal object of gaining land. Nevertheless there have been cleared full 300 acres of excellent land, producing wheat, barley, oats and clover, yielding from six to twelve bolls after one.

From the nature of the undertaking, there is good reason to suppose that the operations will yearly advance with greater rapidity; especially as the greater number of the settlers have only of late begun to operate. Many, besides maintaining their families otherwise by occasional employments, have in the High Mofs cleared in a year one rood of land; some have cleared two, some three roods, and in the Low Mofs an acre.

It was a remark often made, even by persons of some observation, that by collecting together such a number of people, Kincardine would be over-stocked; and the consequence would be their becoming a burthen on the parish: for as the bulk of them were labourers not bred to any trade, and possessed of little stock, it was foreseen that, for some time, they could not afford to confine themselves solely to the mofs, from which the return must be slow; but behaved, for immediate subsistence, to work for daily hire. Happily these predictions have proved entirely groundless; for such is the growing demand for hands in this country, that not
only

only do the whole of these people find employment whenever they choose to look for it, but their wages have been yearly increasing from the time of their first establishment. In short, they have proved to the corner where they are set down a most useful nursery of labourers; and those very farmers who, at first, so strongly opposed their settlement, now fly to them as a sure resource for every purpose of agriculture. Still they consider the moss-operations as their principal business; none pay them so well; and when they do leave it to earn a little money, they return with cheerfulness to their proper employment. Many of them already raise from 10 to 60 bolls of grain, and have no occasion to go off to other work; which will soon be the case with the whole. Their original stock, indeed, did not often exceed £.25, and some had not even £.10; but what was wanting in stock is compensated by industry.

Of the whole inhabitants full nine-tenths are Highlanders, from the neighbouring parishes of Callander, Balquhinder, &c.; a sober, frugal, and industrious people, who, inured to hardships in their own country, are peculiarly qualified to encounter so arduous an undertaking. From this circumstance, too, arises a very happy consequence; that wearing a different garb and speaking a different language from the people amongst whom they are settled, they consider themselves in a manner as one family transported to a foreign land. And hence upon all occasions of difficulty, they fly with alacrity to each others relief. Neither ought it to be forgotten, that, from their first settlement to the present day, not a single instance has occurred amongst them of theft, bad neighbourhood, or of any other misdemeanour, that required the interposition of the civil magistrate. Nor, however poor in circumstances, has any one of them ever stooped

stooped to solicit assistance from the funds of the parish appropriated to that purpose.

Though few of the tenants entered with a large stock, one only has been obliged to leave the moor from incapacity to proceed. Many indeed have spent their small stocks, and even run a little in debt: but in this case they have been permitted to sell their tacks upon the following conditions: *1st*, That the purchaser shall be a good man: *2^d*, That the feller shall take another possession. By this manœuvre a new inhabitant is gained; while the old one, relieved from debt, and aided by experience, recommences his operations with double spirit upon a new possession. The monied man again, has at once a house and a piece of ground; the want of which, chiefly, startled new beginners.

Some have even made a kind of trade of felling; inso-much, that from the year 1774 to the present year 1792, no fewer than fifty sales have taken place, producing in all the sum of 849 l. Sterling. This proved from time to time a most seasonable recruit to the colony, and gave new vigour and spirits to the whole.

The number of the settlers is productive of an excellent effect; that although some are generally absent, enough still remain to occupy the water constantly. In a favourable day there may be seen hundreds, men, women, and children, labouring with the utmost assiduity. The women declare they can make more by working at the moor than at their wheel; and such is the general attachment to that employment, that they have frequently been discovered working by moon-light.

Another happy consequence arising from their numbers is the great quantity of moor they consume for fuel. There are in all 115 families. Each family requires at an average 10 dargues

dargues * of peats yearly. Each darg uncovers a space equal to 10 square yards of clay: so that by casting peats, the moss tenants gain yearly about 6 roods of land.

The advantage too, of providing their fuel with so little trouble, is very great. They require yearly 1150 dargs of peats; which, as each darg when dried and stacked is valued at five shillings, are worth 287 l. 10s. Sterling; a sum which otherwise must have been expended on the prime cost and carriage of coals. Many of them cast peats for sale; and 100 l. worth are yearly disposed of in the town of Stirling, the village of Down, &c.

Though moss-work be laborious, it is at the same time amusing. The operator moves the moss five feet only at a medium; and the water, like carts in other cases, carrying it off as fast as it is thrown in, excites him to activity. Still he must submit to be wet from morning to night. But habit reconciles him to this inconvenience; while his house and arable land fill his eye and cheer his mind. Nor is it found that the health of the inhabitants is in the smallest degree injured either by the nature of the work or the vicinity of the moss.

The quantity of moss that one man can move in a day is surprising; when he meets with no interruption, seldom less than 48 cubic yards, each weighing 90 stones. The weight then, of moss moved per day is no less than 4320 stones. A cubic yard is moved into the water, and of course carried into the river Forth for one farthing. It follows, that the expence of moving 48 cubic yards is one shilling. But the

T t t

same

* A dargue (or darg) of peats, is the quantity that one man can cast and two can wheel in a day to the field where they are spread out to dry.

same quantity moved to the same distance by carts would cost 24 shillings. Hence the advantage derived from the possibility of floating moss in water, and the great importance of having water for that purpose.

The moss, when contrasted with the rich lands surrounding, appeared, especially before the improvements, a very dreary spot; one wide unvaried wild, totally unproductive, unfit even to furnish sustenance to any animal, except here and there a few wretched straggling sheep. Besides, it entirely cut off all connection betwixt the farms on either side; amongst which no intercourse was practicable but by a circuit of several miles.

The scene is already greatly changed. The following are the numbers of the inhabitants now residing in the moss; also of their cows and horses, and of the acres gained by them from the moss, together with their produce.

Number of Scotch acres cleared from moss,	350
Men, Women, Boys and Girls.	764
Number of cows at least,	201
Ditto of horses and carts,	54

Their produce in bolls cannot be exactly ascertained: but, considering the goodness of the soil, may be fairly stated at 8 bolls per acre, *inde* 2400 bolls.

As oats are the staple commodity, the calculation shall be confined to that grain. According to the fiars of Stirlingshire, crop 1790, carse oats are valued at 14s. per boll. *Inde* 2400 bolls at 14s. is 1680 l.

A track of ground so considerable, formerly a nuisance to the country, thus converted into a fertile field, filled with inhabitants, comfortable and happy, cannot surely be surveyed with an eye of indifference by any person whose mind is at all susceptible of feeling or of public spirit.

An

An excellent gravelled road 20 feet wide and a mile and a half long, is now carried quite across the moss. By this means, in the first place a short and easy intercourse is established between two considerable parts of the estate, formerly as little connected as if separated by a lake or an arm of the sea. Secondly, the inhabitants of the Moss, to whom, hitherto, all passage with carts or horses was impracticable for at least one half of the year, have now obtained the essential advantage of being able, with ease, to transport all their different commodities at every season of the year. This road was entirely formed by the hands of the moss-tenants, and gravelled by their own carts and horses: a work which, it will not be doubted, they performed with much alacrity; when it is considered that to the prospect of procuring a lasting and material benefit to themselves, there was joined the additional inducement of receiving an immediate supply of money, the whole being done at the proprietor's expence.

The possessions are laid off in the manner best fitted for the operations: and are divided by lanes running in straight lines parallel to each other, Parallel to these again the drains are carried; and this straight direction facilitate the progress of the water with its load of moss. Upon the bank of moss fronting the lanes, the operation of floating is begun; and twenty or thirty people are sometimes seen heaving moss into the same drain. That the water may be the more conveniently applied, the lanes include between them the breadth of two possessions only. The new houses are erected upon each side of these lanes at the distance of 100 yards from each other.

Before the formation of lanes and roads, and while yet no ground was cleared, the first settlers were obliged to erect their houses on the surface of the moss. Its softness denied

all access to stones; which, at any rate, are at such a distance as would render them too expensive. Settlers, therefore, were obliged to construct their houses of other materials. Upon the Low Mofs there is found for this purpose great plenty of sod or turf, which accordingly the tenants use for the walls of their houses. For the rudeness of the fabric nature in some measure compensates, by overspreading the outside with a luxuriant coating of heath and other mossy plants, which has a very picturesque appearance.

But upon the High Mofs there is no sod to be found. There the tenant must go differently to work. Having chosen a proper situation for his house, he first digs four trenches down to the clay, so as to separate from the rest of the mofs a solid mass, containing an oblong, rectangular area, sufficiently large for his intended house. This being done, he then scoops out the middle of the mass, leaving on all sides the thickness of three feet for walls; over which he throws a roof, such as that by which other cottages are commonly covered.

Upon the softest parts of the mofs, even these walls cannot be obtained. In such places the houses are built with peat dug out of the mofs, and closely compressed together while in a humid state*. It is necessary even to lay upon the surface a platform of boards to prevent the walls from sinking; which they have frequently done when that precaution was neglected. After all, to stamp with the foot will shake the whole fabric as well as the mofs for fifty yards around. This, at first, startled the people a good deal; but custom soon rendered it familiar.

The colonists have now made considerable advancement
in

* This does not apply to the *morass*, upon the surface of which, it has already been observed, it is impossible to erect houses in any shape.

in rearing better habitations for their comfort and convenience. Their huts of turf are but temporary lodgings. As soon as they have cleared a little ground, they build houses of brick; when the proprietor a second time furnishes them with timber gratis. It has also been found necessary to relieve them entirely from the payment of the burdensome tax upon bricks; a tax which surely was never intended to fall on such poor industrious adventurers; and which, without this assistance, would have proved a most effectual bar to the employment of these materials.

There are now erected in the moss 69 brick-houses, substantially built with lime. The total expence amounted to 1033*l.* sterling. And it is a very comfortable circumstance, that the money expended upon these houses is mostly kept in circulation among the inhabitants themselves: for as a number of them have learned not only to manufacture but also to build bricks, and as others who have horses and carts furnish the carriage of lime and coals, they thus interchange services with each other.

With a view to excite the exertion of the colonists, the following premiums have lately been offered: 1. To the person who shall in the space of one year remove the greatest quantity of moss down to the clay, a plough of the best construction. 2. To the person who shall remove the next greatest quantity, a pair of harrows of the best kind. 3. For the next greatest quantity, a spade of the best kind, and 10 *lb* of red clover-feed. But as these premiums, if contested for by the whole inhabitants, could reach but a very few of the number, they have therefore been divided into six districts according to their situation, and the above premiums have been offered to each district.

The establishment of this colony has no doubt been attended

tended with a very considerable share of expence and difficulty; for the undertaking was altogether new, and there were many prejudices against it, which it was necessary to overcome. At the same time it was noble and interesting: it was to make a valuable addition to private property: it was to increase the population of the country, and to give bread to a number of people; many of whom having been turned out of their farms and cottaries in the Highlands, might otherwise, by emigration, have been lost to their country: and that too at a time when, owing to the great enlargement of farms, depopulation prevails but too much even in the low countries. And it was to add to the arable lands of the kingdom, making many thousand bolls of grain to grow where none ever grew before.

These considerations have hitherto preponderated with the proprietors against the various obstacles that present themselves to the execution of so extensive an undertaking. Should their example tend in any degree to stimulate others, who both in Scotland and in England possess much ground equally useless to the country, to commence similar improvements, it would be a most grateful consideration superadded to the pleasure already arising from the progress of this infant colony.

ESTABLISHMENT OF A SCHOOL IN THE MOSS.

Since writing the above Account, it was found that the inhabitants still laboured under two material disadvantages: First, That there was neither, within their reach, any public worship in the Gaelic Language, nor any means of obtaining religious instruction in the same; and the bulk of them have too imperfect a knowledge of the English, to be capable of receiving much instruction in that language. Secondly, The difficulty of procuring proper education for their children,

the

the distance of the Parish School from the greater number, being such as almost to preclude a possibility of sending them thither, and their circumstances not enabling them to support the expence of a Teacher. In this situation it occurred that an application to the Society for propagating Christian Knowledge, might probably be attended with success. For though by the rules of that Society, its establishments are confined chiefly to the Highlands, yet as almost the whole inhabitants of the mofs are Highlanders, they seemed to have a well founded claim to the aid of the Society. Application having accordingly been made by the proprietor, the Society was pleased to enter very warmly into the situation of these poor people, and with the greatest alacrity agreed to the appointment of an experienced Teacher, who was settled in the mofs at Martinmas 1793. This Teacher who is well acquainted both with the English and Gaelic Languages, officiates through the week as a Schoolmaster, and on Sundays convenes the people in the School-House, where he instructs them in the principles of Religion, and prays with them in their native tongue. In order to promote this establishment, and with a view to procure a Teacher better qualified than common, the proprietor has engaged to contribute L 5. *str.* annually, over and above the salary of L 10. allowed him by the Society, and the conditions commonly required by them, of furnishing gratis, a good dwelling house and school-house, a kail yard, fuel, and the maintenance of a cow. And as an additional encouragement he has voluntarily given the schoolmaster, about an acre of good carse land, free of rent.

No. 3.

OBSERVATIONS ON THE CULTIVATION OF WASTE LAND.

THE following Letter is written by John Smyth Esq. of Balharry, a general improver, in the parish of Alyth, in the Stormont, a district of Perth-shire, who is a Cultivator of waste land since 1781. He has inclosed, brought under culture, and set off five new farms, formerly waste land, containing 520 acres; and has begun to and passes his working stock upon the sixth, at Martinmas 1797, which contains above 128 acres more.

The rent, over-head, in the original state of the land, was under 1s. 6d. per. acre; it is now acknowledged to be very moderately set, and already pays above 16s. per acre: There are some rises of rent agreed on. At a low computation each acre will now produce subsistence for a human being.

Edinburgh, 26 June, 1796.

DEAR SIR

During your Agricultural Survey of the East part of Perthshire, last autumn, you mentioned to me, that the progress I had made in the cultivation of waste lands had drawn your attention; and that you wished to know the method I had followed.

In compliance with your request, I shall give you a genuine account; I wish you may find it in any degree interesting. My success, which has no doubt been considerable, having
chiefly

chiefly followed from perseverance and a strict attention to œconomy; means which, under the blessing of God, rarely fail of success in any undertaking.

The first object I pursued was for the maintenance of my stock, to dress all my small patches of old or formerly cultivated land, of which I had but little, and at same time to cover the surface of my new or waste land, just as thick as possible, not only by haining it (saving it from cattle) and protecting it from being used by either man or cattle, but by encouraging to grow every thing that naturally grew upon it; even broom, Scots firs, and by sowing of whins; and when I got the ground covered compleatly with an impenetrable bed, even of trash, I thought a great point was obtained.

My next object, was to clear such a portion of waste land as I could well manage, I mean, keeping in my view what I should be able to do, 1st, as to inclosing and clearing from stone, while the different ploughings were going on; 2d, the extent I should be able to bring marle or lime to; and lastly, to provide dung for, which commonly proved my chief difficulty, but which was lessened by the object of gain, inclining a neighbouring village to increase, by care, the quantity preserved by them.

My methods of breaking in, were three: the 1st, when the surface was not impenetrable, I, by means of strong oxen and plows, plowed it up as it then stood. This I found the worst method, for though the ground was soon thereafter so far cleaned, by the best of the broom, fir trees, &c. being picked away by the neighbouring cottagers, who had leave to do so for their own behoof, the remainder with all the heath was left, which being very difficult to be got rotted, kept the ground long open and retarded the after operations

U u u

greatly.

greatly. Therefore, I difused this method early, and watched the feafon, when the furface trash would burn, and burnt it; but gaining by experience, that oleagenous and volatile matter fo ufeul for food to plants, both in the roots and ftems was thereby forced away, I found a third method much better than any of the former, which was to dig up the whole of this trash, lay it on its fide, and let it ly a year or two, as the courfe of my operations would fpare; then before winter came on, I difpofed of all the withered trash that would fell, and burnt the remainder in corners.

I found by what fell off from the whins, broom, firs, &c. in the courfe of their withering, the constant warm moiſture and feclufion from the air neceffary to vegetation, the heath, fog, or mofs, bent and other coarfe vegetable ftems and roots were rotted, and the furface not only preferved from the wafte by expofure to fun and wind, but greatly thickened, ameliorated, and in a manner made into vegetable mould, fo that after fuch a courfe, I have often had very good crops, even before I put either marle, lime, or dung, to the ground; after this method too I found the land go kindlier down to grafs.

Both the fecond and third method greatly, and nearly equally ſhorten the general labour; and though I much more approve of the third, yet rather than retard my operations I often have praftiſed the 2d.

I break up the ground by a large and ſtrong plough, to which I put always, for the firſt ploughing, fix and ſometimes eight oxen, of from 40 to 50 ſtone weight, in working condition; by this means I put the ſole of the arable ground, or under furface, as far as I can from the upper furface; and as I have my people, who dig, blow, and cart the ſtones
 constantly

constantly in the field, attending the ploughs, obstructions are nearly removed at the first and all at the second ploughing.

The first ploughing I always give during the course of and as early in the winter as I can. If the ground has been completely bedded over, and the trash has burned well; or if the third method has been accurately and successfully performed, I sometimes with and sometimes without a second furrow, sow oats the ensuing spring.

But if the ground has been broken up in the first manner, or if the 2d or 3d method has not been got completely accomplished, I give up thoughts of sowing the first year; let the first furrow lie till my seed time is over; and the ground is again grown a little together, and I then cross-cut and then brake-harrow it, all of which operations I have been obliged to repeat when I break up in the first method, or when the second or third was ill done: this shews the advantage of doing things to purpose, for when done to the purpose, I have never found these repetitions necessary.

The crops I practised were 1st, oats; 2d, turnips, yams, and other potatoes; 3d, barley with grass-seeds; but from the want of dung for turnip and potatoe and a desire to get on, (as I was resolved never to keep a farm after a farmer could make bread of it, and make payment of something like a rent,) I several times have had first oats and then barley with grass-seeds, in this case the whins, broom, &c. were very apt to rise; But for that reason the field was the sooner broke up again by my myself or the tenant; and then an intervening turnip-crop, during the second turn of the field, reduced and extirpated these trash pretty completely. The marle or lime I used, I have been always very careful of, either by ploughing them in with a very shallow seed-fur-

row; or putting them on even after the seed-furrow and only harrowing in.

I wish always to keep a quantity of compost, fresh mould from ditches, sediment of water with rotten vegetables, peat-moss, &c. and some dung, and when the fields go down to grass, any parts where the grass is sickly, or inclined to blain, I do cover with compost and fresh seeds, which I have found great benefit from.

As to the success, I need not trouble you with a detail; my first essay will show the reward is sufficient for the labour: It was on the farm of Over-muirtown, consisting of about 15 acres infield, as much outfield, and a muir, valued at little and worth little. It was purchased at L. 520 from the late Dr Young of Edinburgh, who made a great deal of money by his knowledge of the value of land, and it was then possessed at L. 20 yearly rent by an intelligent and industrious tenant, who has since become the proprietor of the adjoining farm by his success in his profession; and he gave up this farm rather than pay only L. 3 additional rent: another tenant took it at L. 23 rent and became bankrupt; which circumstance made me at first become a cultivator of waste land. I have, out of this farm, a considerable thriving wood and ground for a sheep park, on which I can put no positive value; but I also made two farms, set well worth the money, to two very thriving tenants, and as punctual payers as any in the kingdom: the amount of their money rent is L. 240 str. besides kains, carriages, &c. and this one of my muirs, even in a year of scarcity, such as the last was, produced food for about 200 fellow subjects, besides the cultivators of it.

"My other essays have been more extensive, and though they have answered very well, have not equalled the first;

but

but they have had the happy effect to diffuse the knowledge of and spirit for this kind of improvement, even where it could hardly be expected, among small tenants possessing from year to year at will.

I am, with much regard,

Dear Sir,

Your most obedient servant,

JOHN SMYTH.

*The Rev. Dr Robertson at }
Callander of Monteath.*

No. 4.

STRUAN'S LETTER RELATIVE TO RANNOCH.

THE following letter from Colonel Robertson of Struan contains such just remarks, not only on his own country, but on the Highlands in general, that I cannot alter or abridge it, without doing it injustice.

SIR,

I had the pleasure to receive your very obliging letter of the 20th inst. and have great satisfaction in transmitting to you the account you mention.

The climate of Rannoch is rather more favourable than that of other parts in the same latitude, probably owing to the vicinity of Loch-rannoch, which seldom or never freezes, and to its being better wooded than most other districts in Scotland.

Westerly winds are the most prevalent in this country. They are at times exceedingly impetuous and occasion considerable

ble damage. The changes in the weather are so frequent and so sudden, that no satisfactory observations can be made upon the hydrometer or barometer.

In some parts the soil is equal to any in the Highlands of Scotland; a great part of it being still tolerably productive, although continually cropped for more than a century past, and otherways miserably managed. What is at present under cultivation bears but a small proportion to what seems to be equally fit for that purpose, were it properly inclosed and sheltered by belts of planting. In several parts pretty far up on the hills, the marks of the plough are still visible; and by procuring to these places the shelter which they formerly had by surrounding woods, they might undoubtedly be still cultivated to advantage.

There is good clay fit for pottery-work, in this district; and as marle has been found in the neighbourhood, it is hoped that the trials which are to be made here of that stimulus will be successful.

There are inexhaustible quarries of lime-stone in different places; and the inhabitants are beginning to make the proper use of it, in raising better crops. When the estate of Struan was the property of government, Mr Small the factor upon it, erected a mill for pounding raw lime-stone, which by all accounts answered the purpose, beyond expectation: and the pounded lime-stone was found to be superior in some respects, as a manure, to that which was burnt.

There is no appearance of coal, but there are very extensive tracts of moss at a convenient distance from the inhabited parts of the country. The proprietors do not allow their tenants to cut wood for fuel, except when the peats have
not

not been properly got in; which frequently happens in rainy seasons.

The casting or cutting of peats is in general very injudiciously managed, great part of the mosses being entirely lost by that circumstance. Previous to the season for cutting peats, the mosses ought to be surveyed by proper judges, and certain parts of them allotted to the different tenants. It would also be materially advantageous to induce the tenants, during a favourable season, to cast, as nearly as possible, double the quantity they commonly consume in one year, one half to be carried home as usual, and the other half to be made up in stacks near the moss: by which exertion for one season, they would ever after be secured from the great inconvenience of scarcity of fuel, to which they are now so frequently liable.

The farmers in general have no idea of using the necessary means of securing their dung-hills, which are commonly made upon sloping ground, whereby a great part of their substance is drained off and entirely lost.

The most evident and advantageous improvement for some of the proprietors in this district, would be to endeavour to prevent, as much as possible, the overflowing of an extensive meadow, of which they have shares. It does not seem possible to prevent the great floods in winter; but by widening the channel of the river below the meadow, and clearing it of large stones, the summer and harvest floods might be so far prevented as not to be materially detrimental: and by embankments a great part of the meadow might be converted into good arable ground.

There is a moor of considerable extent at the east end of Loch-rannoch, which seems to be very improveable.

The present high wages of servants is an insurmountable
obstacle

obstacle to the well-being of the tenants, and of course to agricultural improvements. It would be in vain for the proprietors of any particular district to attempt remedying this evil, which nothing less than the adoption of a general plan for that purpose, through all parts of Scotland can effectuate.

The fousing of cattle is not so much attended to as it ought to be ; which has the worst effects.

Obliging the tenants to keep proper bulls and rams is neglected.

Until a greater proportion of land can be brought into tillage, it would be improper to encourage the culture of flax upon a great scale.

The tenants of Rannoch in general have not long leases ; and it would be improper to indulge them in that respect, until they can be brought to adopt a better method of managing their farms : which cannot be done suddenly. Such as are remarkably intelligent and industrious have leases of the endurance of from seven to nineteen years. Some farmers upon the estate of Struan, who got leases of extensive farms from government for forty one years, of which there are still many years to run, manage their farms with great propriety.—A great number of small tenants were removed to make place for these tacksmen.

Although it would be evidently advantageous for the proprietors in the Highlands to remove, at least one half of their tenants, it is to be hoped that humanity as well as proper attention to the interests of the nation at large will always be sufficiently prevalent (with those who can possibly avoid it) to induce them to refrain from adopting that measure ; but as many of the proprietors, from unavoidable circumstances, will be under the necessity of having recourse to this expedient, would it not be an object worthy of the paternal

paternal care of government to devise some means of enabling them to follow their earnest wishes to prevent the depopulation of the country? Premiums are very properly allowed for the encouragement of every useful improvement of national advantage; and none can be of more general utility, than keeping the people in their own country. Upon the same principle; why should not the proprietors of estates in the Highlands, who sacrifice their own interest to that of the nation and to the dictates of humanity, be in some degree, indemnified by government? Timous relief in this respect would be of *real* importance to the country, and at the same time give many proprietors the heart-felt satisfaction of not being forced by cruel necessity, to act in a manner repugnant to their feelings.

It is only of late that two-horse ploughs, without a driver, have been generally used in Rannoch—These ploughs do not seem to be properly constructed, but are unusually heavy and strong: which may in some degree be necessary on account of the large stones under ground, too frequently to be met with in almost all the arable fields.

All the tenants have a proportionable share of hill-pasture; but as most of them cannot derive any considerable advantage from it, owing to their being unable to keep proper stocks of sheep, it would seem reasonable, upon condition of allowing them a certain diminution of rent, that they should be prohibited from keeping sheep, which upon the whole would be advantageous to them, and evidently so for the proprietors, who might, by these means, draw the full value of their hill-pasture, by letting it to sheep-farmers.

The woods upon the estate of Struan on the south-side of Loch-rannoch are extensive *, and would be of great value,

X x x

were

* See the section on woods and plantations in the preceding report

were they situated in a less remote part of the country.—The fir-wood is of a superior quality, and grows to a sufficient size for masts and yards to the largest ships—Although there are some rapid falls in the river, which flows from Loch-rannoch, it does not seem impossible to float timber, during great floods, to the Tay; and by blowing the rocks, in different places, which impede the passage at other times, it would be practicable, during the greatest part of the year; by which means, wood for ship-building, of a superior quality to what is now imported, could be delivered at Perth, at the same, or perhaps a lower price, than the foreign timber.

It would seem that the slow progress of improvements in the Highlands, not only in Perthshire, but in general, may be, in a great degree, attributed to the inadvertency of many of the proprietors, especially those of great estates, who have only of late begun to give serious attention to that very important object.

Notwithstanding the supposed poverty and misery of the lower classes of people in the Highlands, they seem to live more comfortably than those of the same order in the low country; which any common observer will be sensible of, by attending to the appearance they make at Church, or wherever they have occasion to assemble; as there can be no better index to point out the circumstances of the lower classes of Mankind than their faces and cloaths.

At Mount Alexander, part of the estate of Struan, there is a fine spring called the silver well, on account of the remarkably bright coloured sand to be found always at the bottom of it. This well was lately cleaned, to a considerable depth, and in a few days, was again supplied with its usual bed of sand.

For

port, where the number of acres under different kinds is accurately taken down from the notes furnished by this gentleman.

For between four and five hundred years past, the family of Struan have been in possession of a spherical transparent stone called *Clach na bratich* (the Stone of the Standard or colours.) Tradition says that this stone was found by Duncan of Athol, the founder of that family, in Perthshire in the following manner. As Duncan was in pursuit of Macdougall of Lorn, who had made his escape from him out of the island of Loch-rannoch, night came upon him towards the end of Loch-ericht, and he and his men laid them down to rest, the standard-bearer fixing the staff of his colours in the ground. Next morning, when the man took hold of his standard (as it happened to be fixed in loose, spouty ground, near a fountain,) the staff, which probably was not very small or well polished in those days, brought up a good deal of gravel and small stones, and among the rest came up this stone, which being of a brightness almost equal to crystal, Duncan thought fit to keep.

They ascribe to this stone the virtue of curing diseases in men and cattle, especially such diseases, whose causes are not easily discovered. Frequent application is made to the present proprietor of this stone, not only by his own tenants, but by people at a great distance, and all of them he has had occasion to examine on the subject, seem convinced of its efficacy; insomuch that many of the present generation in Perthshire would think it very strange to hear the thing disputed*.

From the archives of the family of Struan it appears that this Duncan†, a son of Angus Lord of the Isles, styled of A-

X x x 2

thol

* The family of Advorlich in this county has a stone, to which similar virtues are ascribed. It has a crystalline appearance, with a fine tinge of red.

† Hence the Robertsons are frequently called Clann-Dannichi, the descendants of Duncan.

thol (as were several of his successors) of whom the family of Struan is descended, having been invited over by those in the Highlands of Perthshire, who found themselves oppressed under the tyranny of the Baliol party, to be their captain and leader, had got such a footing in Athol, Rannoch and the adjacent countries, as enabled him to render essential service to King Robert Bruce, after he was defeated at Methven and Dalree.

In troublesome times Duncan resided in the island of Loch-tummel, where he is said to have received his king. Part of the conversation that past upon the occasion, particularly the king's promise to take care of Duncan's fortunes, when affairs should be settled (which promise was afterwards amply performed) is still related by the people of the country. The king resided afterwards for some months in the wood Kynachan in the neighbourhood of Loch-tummel, where there were temporary habitations built for him and his followers. The place is known to this day by the name of Larach ty an Ri (ruins of the king's house,) and there are still faint vestiges of the principal house and other buildings. It appears that the queen had been there also, for a pool near it, upon the river Tummel, is called the Queen's ferry.

That you may be enabled to form a just opinion of the character of the late Alexander Robertson of Struan, I shall give you a short sketch of it drawn by my father, who could not be suspected of partiality towards him, as he did every thing in his power to deprive my father of his birth-right, in favour of the female line.

“This gentleman was much esteemed by all of his acquaintance for his sprightly wit and agreeable conversation. He had a considerable genius for poetry, as appears by many of the pieces found in the collection published under his
name,

name, after his death; * but he wrote carelessly and was seldom at the trouble to revise what he wrote. Many of those, who were about him, are of opinion, that he never intended any thing for the press, which was probably the case; for there

* In his description of mount Alexander, one of his seats, he says, in the truest poetic vein :

There shady trees adorn the river's side
And crystal fountains thro' the vallies glide
Woods, hills and dales with milk and corns abound,
Traveller, pull off thy shoes, 'tis holy ground.

A character of Struan, besides that given by his relation in the text.

Be it ne'er said of Struan he deny'd
His tender aid, when poor or needy cry'd;
For in each footstep of his life, 'tis known
To mind their wants, he quite forgot his own.
Sound was his judgment and his reason firm,
His virtue steady and his courage warm;
Unmov'd, he bore the shocks of adverse fate
Nor fear'd the danger, were it e'er so great.

A part of his epitaph written by another hand :

No more thy gentle numbers please the ear;
Stopt is that spring, from whence they flow'd so clear;
Yet tho' thy body be reduc'd to dust
As falls alike the good, the brave, the just,
Thy name, illustrious shade! shall e'er survive,
And deathless fame unfading honours give.
There's nothing dignifies so much this dust,
As that, like God, he aim'd at being just.

How contrary to all this and how false the picture of Struan drawn by a snarling cynick, about 25 years ago, who in a fit of the spleen and disposed to detraction, poured forth a torrent of scurrility on the ashes of the *dead*, which he concludes in these words, "He died as he lived, a sot." Some dogs bark at the moon.—Very different was the character given by Lewis the fourteenth, who was wont to say that Alexander Robertson of Struan was one of the most accomplished and best bred gentlemen at the court of France, the most refined at that time in Europe.

there are a number of pieces in that collection, which he would have committed to the flames, if he had intended a publication; especially if he could have foreseen that his manuscripts were to have fallen into the hands of a mercenary servant: for whatever he might have said or written in his youth, or over a bottle or in an angry mood, he had too much sense and judgment, in his calm deliberate hours to give public offence to morality or decency."

I remain, with great regard,

SIR,

Your most humble servant,

ALEX. ROBERTSON.

Rannoch 30th }
Jan. 1797. }

To the Rev. Doctor James Robertson, Minister at Callander.

No. 5.

5th July, 1795.

RESULT of the TRIALS of FINE WOOLLED SHEEP, by MR
HALDANE of Gleneagles in Perthshire.

ALL along the Ochill hills in the shire of Perth, there is a very extensive tract of as fine sheep pasture, as any in this island, which from bridge of Allan on the west to beyond Newburgh on the east, may extend to above 20 miles in length, and on an average to between five and six in breadth, from south to north.

The summits of some of this range of hills in the centre, rise to a very considerable height, perhaps the highest to near 1500 feet above the level of the sea; but the greater
part

part of them are lower, from 500 to 1000 or 1200.—And on the sides, at least on the north and east, they rise gradually and are intersected by many rivulets descending from them. There are many little, and some large open glens, and hollows running through them, and many gently rising hills, or hillocks, or swells, every where interspersed. They are mostly green to the top, covered with fine, short, sweet grass, in general dry and admirably fitted for the pasture of sheep, for which purpose they are used; the feeding of cattle on them being less practised than formerly, as being found hurtful to the sheep;—they lie in the very centre of the country; and are crossed from south to north by three or four great and convenient roads. The water of Devon rises in the west end, and runs for ten miles east through the heart of them. The variety of this verdant scene is beautiful;—the shelter to be always found on some side, is never wanting; and the conveniency for pasturage, especially as heath is to be found here and there near the tops, in some places, cannot be exceeded.

With these natural advantages, sheep feeding has long been followed here; and at present there cannot be under 50,000 in the above extent of this county alone, besides what may be in Stirling, Clackmannan, Kinross, and Fife, shires on the south side.

Above 40 years ago, the breed or kind of sheep almost universally along these hills, was a small, white or grey faced, coarse woolled sheep, of small value, either as to carcase or fleece. But at that time the sheep-holders were persuaded to make trial of a larger boned stronger sheep of the black faced, and black legged kind, with a heavier fleece; and rams of that kind were first got from Tweed-dale, and some

of

of the grey faced kind from Crawford Muir and other places; and a good deal of pains was taken thereby to improve the breed, and raise the size of the carcase and quantity, though not much the quality of the wool. Inveterate prejudice for old habits, and their not being in use, or not having sufficient stocks and knowledge to rear as many as they needed, or finding it difficult, made the change go on slowly; but in time it became the general practice rather to go to Linton and the south country to buy lambs and hogs* of the black faced kind, even at so high a price as 5s. the lambs, and 10s. the hogs a head, than to raise them from their own flocks, which might have been done at 2 or 3s. cheaper, besides being less liable to fail, from being bred on the ground; and further, besides giving them an opportunity of always selecting out of those they bred themselves, such as they found most valuable for their different qualities, and thereby still more to amend their stocks, a thing which will ever be found of the highest importance.

In this way, they have chiefly gone on; and at an expence of several thousand pounds every year, supplied themselves with young sheep, which they might have raised much better at home, and which might have been more speedily and effectually improved in various qualities, by getting better rams into their possession, and by degrees increasing their own flock, with proper attention.

Mr Haldane has long endeavoured to combat the prejudices, and some of the practices of these people. And has in some instances, among his own tenants, prevailed with them to breed a number of their own sheep, and to be more attentive to their rams; and their sheep are certainly improved, being a well boned, stout, hardy sheep, and give a higher price. The best of their wedders, the carcase weighing

* Sheep of one year old.

ing about 60 lb. or more, selling sometimes at 3 and a half years old, so high as 17s. and 17s. 6d, and their picked ewes at 13s. and 14s. though these are rather above their ordinary prices.

But they are still far behind, and have many errors and defects in their management, which their rooted aversion to change prevents them, as in other places, from altering;—though the advantage they have actually received by the above mentioned change of their breed, between the years 1750 and 1595, might serve as a lesson to them, and shew them, that by again adopting by degrees a farther improvement in their breed, and getting into a better carcased and finer woolled kind, a great benefit might arise to them.

Their wool at present is mostly coarse, and the fleece from $1\frac{1}{2}$ to $2\frac{1}{2}$ lbs, weight, and sometimes their heaviest wethers a little more—And sells the fineared kind at 7s. or 8s. per stone; and their white wool from 8s. to 10s. and sometimes 12s. per stone of 22 ounces to the pound, and 16 pounds to the stone.

About 20 years ago, Mr Haldane having been favoured with a very fine young ram from the late Marquis of Rockingham in Yorkshire, out of a cross between a famous breed of the Marquis's, and Mr Bakewell's, brought him down to that country, with a view to mend their sheep. He turned out a beautiful animal, and certainly of a very valuable kind, He was broad and straight in the back and particularly well turned and broad behind, and thicker in the shoulder than our common kind—polled—high nosed—white faced—and white legged—with large, clear eyes, and fine thin ears—an open countenance, and a thick ruff of fine wool about the neck and shoulders; and a broad long tail, and rather smaller in the bone than might have been expected from his

size. He was gentle and quiet, and not given to leap, or wander out, and when clipped the second year, had a great deal of fine wool in his fleece, which weighed between 7 and 8 lb. and the third year more. He was fed in very fine grafs inclosures, long used for sheep, in common with the other country kind, commonly picked sheep, kept there for two or three years; and as he throve remarkably well, and never had any disease, his appearance and quantity of wool was far beyond the others. In a few years, he produced a number of his kind, resembling him, from the best picked ewes could be got. But his progeny, tho' some of them very handsome large sheep, with fleeces of 5 lb. weight, were hardly any of them so fine, or pleasing in shape or look, nor was their wool so very fine as his—yet the difference was not great—and some of his gets were killed at $4\frac{1}{2}$ years old, weighing full 18 lb. the hind leg, and 16 lb. the fore, as excellent mutton as could be eat, in so much that it was taken by some of the best judges for very old large fed mutton of the best country kind. And some of them were sold at four years old for from 20s. to 25s. which were rather too fat, so that when you cut the loin, you could hardly get lean enough to go round a table.

This ram was kept for 8 or 9 years, but his teeth beginning to fail, and his wool to grow less, and even not quite so fine all over as formerly, he was sold fat for 28s.

It cannot fail to appear as a strange instance of stupid obstinacy, and almost unconquerable prejudice, that although all the best and most experienced store-masters around, in other respects very good and very intelligent men, were frequently invited to see this sheep, and all admired him very much, and confessed there never had been any thing like him in the country, and that even his lambs were far before theirs,

and

and fold much higher and the wool greatly more valuable; yet they could not be prevailed on, even to make a trial, how the kind might do on their sheep farms.—Mr Haldane again and again pressed them only to send down half a score each of their best woolled picked ewes of the best shape and size to his park at the proper season, and offered to have them covered by his ram for nothing.

Their answer always was “The kind will do very well in your parks but not in our hills, and we will not risk changing our breed which now answers with us—Such large heavy woolled sheep cannot travel over our high and distant grounds to seek their food, or make their way through the snows in winter—or stand our storms—and must certainly require to be fed and kept in winter, which is an expence we cannot afford; and their lambs must be more tender and more of them die in the spring—Our high rough pasture is too coarse for them; and if we save or allot for them our best low lying and kindliest fields, we will injure and spoil the flock;—And in short we cannot venture to keep different flocks and herds.”

It was in vain, that he ventured to say “You may at least make a small trial on your lowest grounds which can never hurt you; these ills you fear most probably will not happen, and without a fair experiment you cannot judge.—You see how well the kind has answered with me, and how much more reasonable it is in itself than yours; how much you were benefited by the last change against which you were equally and groundlessly obstinate for a long time; and may observe how much more thick and close a fleece my sheep have than yours, which must enable them to stand out against the rain, snow and storms, and lying wet, better than yours, with open thin shaggy fleeces can possibly do—Even if you should give them

a little meal to help them in the stress of storm of winter, or *hain** ground for them, it is only what prudence, and the many and heavy losses you suffer yearly both in sheep and lambs, should lead you to do at present for the flock you have; for nothing can evidently be more absurd, or more cruel, or actually against your real and essential interest, than what you now do, by turning your flocks adrift, through the snows and severe storms of winter, to the most exposed and highest places of your hills, without giving them any thing to eat, except what they can, in some few places scrape with their feet below the snow, or pick *from the leavings of their bare eaten summer pasture*.—It is marvellous, that more of them do not die, and that your losses are not greater. Even where they do survive, they are so starved, and beat down, and weakened, that they become more liable to many diseases, and are so late of fattening or coming into order again, that the season and catching the best markets are lost, and you thereby suffer in the sheep and wool much more than three times the food you need give them would cost to preserve them. The carcase and wool of one of my sheep together is worth double of yours, and were it but a third better, it would do much more than defray all the expence in feeding you can want, and you can never do any thing more wise and profitable, than to be at some little trouble and expence in providing food for the whole of your flocks,—such as various early and luxuriant grasses,—turnips,—cabbages,—tares,—coleseed,—potatoes, and even whins, of all which sheep are remarkably fond, and feed greedily upon them, especially when there is no grass to be found;—and all these you have it easily in your power to cultivate to an extent perfectly sufficient for your purpose, and to supply your sheep at that time

* Save grass.

time of the year, when you have nothing now to give them."

All this, and more was lost upon them—and not one man among them ever sent a ewe to the ram.—The breed however has been kept up;—and is still in Mr Haldane's possession, and thrives in his enclosures, which are low and sheltered grounds.—He has indeed dispersed some of them, both ewes and rams, to sundry people with whom they have thriven well, and encreased the size, and quantity, and quality of the wool. But there is a very general indolence, indifference, or want of active attention through the country, and it is with the greatest difficulty any one can be induced to make experiments, *or pursue them*, if they are to cost the least trouble or expence.

When Mr Haldane became a member of the British Wool Society, he so much approved of their plan, and saw so great advantages to the country in its success, that he determined to give it every support in his power, and to contribute all he could to carry on their views, and make the fairest and fullest experiments for that purpose—with that view, he was at a good deal of pains, and at some expence to provide the best rams and ewes of different kinds that could be procured; and allotted about 100 acres of his enclosures almost solely to that end.—It is ground at the foot of the green hills above mentioned, as much suited for sheep pasture, as any can well be; dry, light, sound land, much varied and sheltered in the surface by plantations, but producing naturally great abundance of fine sweet short grass, having been laid down at different periods, within these 25 years, in the highest order with many of the finest grass seeds, and pastured on ever since, and often with sheep.

He had two very fine rams of his own, of the Rockingham

ham breed above described,—two Spanish ones from Lord Hopeton,—three Cheviot ones, two of them from the society's flock,—three Ryeland ones, two sent him by a friend directly from Heretordshire; and one of them from the society,—two Southdown ones from the society, and one very fine Cheviot one from another hand—in all 13—many more than was needed for any small private flock, had it not been for the use of the country.

His ewes consisted of Rockingham	17
Cheviot	8
Ryeland	5
Southdown	2

And picked ewes from the Ochill flocks around,
 the most remarkable for their shape and quality } 60
 of their wool about

In all 92

With this flock he set out in October 1790—And has bred from them, and other ewes since got in, with all the success he could wish, having hardly, or very seldom lost a sheep, excepting a very few weak lambs, and one of the Spanish rams which was drowned in a large drain.—They have all been remarkably healthy, and had no disease or disorder among them, and a good many, perhaps 6 or 8 of the ewes have had annually two lambs.

In three years the flock encreased so fast, that the ground allotted for them could not longer hold them, and he thought the best way of disposing them, and dispersing the best kind through the country, was by a roup, or public sale by auction, which was made in the end of July 1794, after advertising it in the Edinburgh newspapers, and anxiously through the country—when he sold off about six score of
 wedder

wedder hogs and lambs, and a few young rams and ewes to his own and other tenants around, all of them of the kinds of the different rams above named—the roup was not well attended; but what sold were at tolerable prices; a good deal beyond the ordinary prices of sheep in that part of the country; and the highest price was given to those of the Cheviot breed, *which is the favourite of the country.*

The opportunity that was given here to the whole country to see and examine closely this small flock, which was in excellent order, and the superior fineness of their shape and wool, perhaps did more good to satisfy men's minds, than many discourses might have done, and their seeing, that sheep of a kind they thought too tender, as being brought from a milder climate, would thrive even in the Ochill hills, or in glens adjoining, served to reconcile them to the idea of making trials.—And possibly if others would try the like experiments and supply the country at hand, with sheep, of these kinds, carefully reared, *and at reasonable rates*, it might be one of the best ways of introducing and spreading these breeds and forwarding the views of the society.—With this view another roup was tried here in July, with nearly the same success as the former, and about five score were sold; some of the lambs at 16s.—and of the sheep at 29s.—But still such is the obstinate adherence to old practices, and a settled course of management, and such the inattention or supine negligence of the country, and their aversion to make even probable experiments, that the spirit intended to be raised, hardly seems to be diffused or encouraged, though in a matter surely of the highest moment to the interest of the country.—It was with some regret seen, that the chief buyers were the Butchers for the flesh markets, as the sheep were in fine order.

Besides

Besides the 32 stranger ewes of the different kinds Mr Haldane began with, as above enumerated, he had recourse to three score picked Ochill-hill ewes, in order to try the cross between them and the rams he had procured.—In general this has answered very well—and they have produced very fine lambs, which have mostly taken after *one or other of the rams*—they have mostly white faces, and legs, and their wool is a great deal finer than that of their mothers, which have all black or grey faces; and their size and figure is plainly larger and better than their mothers—Some of them however have taken from their mothers and resemble them—excepting that their wool is finer.—Of the young rams which have been pick'd out and kept, two or three being now two and three years old, of some of the new kinds by both sides, are very handsome, with large fine fleeces and promise to be very fit to breed out of, being exactly of the kind of the best Southdown, Ryeland, and Cheviot rams.

The Spanish ram was a long bodied, long legged, horned sheep, not so handsome, or well shaped as some of the others, his back not being straight from neck to tail, but convex, or rising a little upwards, and his hind quarters rather narrow, and drooping a little to the tail. But his wool superior to any of the rest in fineness and closeness, and he has stood the winters as well as any of them. The only disorder he fell into was a too quick growing of the hoofs, which plaited under his feet and made him lame: But by paring them now and then with a knife he recovered. Not above three or four of the lambs seem to have taken after him.

The wool of these new sheep is a great deal finer, than that of the Ochill sheep, and has been sold at a progressive increasing rate ever since Mr Haldane has had them. The first

first Rockingham wool commonly sold at 16s. per stone, and some could have been picked out of it worth more, but would have lessened the value of the rest. Since he got the other new rams and ewes, and his number has increased, their wool, and that of their breed has been sold at 18s. 22s. 24s. And last year he got 26s. and 28s. for some of it. And he has annually made a piece of fine and very handsome cloth for his own wear, and some coarser for the use of his family, samples of which were shown to the society, and have been valued at from 7s. up to 15s. 16s. and even 17s. per yard, 7 quarters wide. These cloths were spun in the neighbourhood, and wrought, dressed and dyed in the best manner by John Wilson manufacturer in Alloa, a very knowing and industrious clothier, who deserves every encouragement.

The wool of the cross between these rams and the country ewes is not so fine, as that of the entire new breed, yet considerably finer than that of the country. And has been commonly sold from 16s. to 18s. or even 20s. per stone. It makes exceeding good 2d cloths at from 9s. to 12s. the yard. And when narrow at from 5s. to 7s.

It is evident therefore that good cloth can be made in this country from *our own wool*; and that our breed of sheep may be improved, so as to afford it; *which is the very point aimed at by the laudable endeavours of the Society.* And which he is happy in having thus helped in some measure to decide. Mr Haldane has also tried, as far as he could to carry this matter farther and to spread the breed of these rams among the sheep-holders around him. With this view he let them know that they should be welcome to have their ewes covered *gratis*. And desired each of them to send down a score, or more or less, of the best ewes they could pick out,

to his parks, where they should be allowed to run with the rams for a fortnight, upon paying a trifle to the shepherd for taking care of them. But so strong are their prejudices, that many of them otherwise very sensible experienced men, would not even embrace this kind offer. Betwixt 7 and 8 score however were sent down about Martinmas 1792, and were covered; and many of them had lambs of that kind next season, which were kept in common with their own lambs, and from these some of them have reared young tups, and kept them among their flocks for covering in November last, along with their other rams, although only a year and a half old. From some strange jealousy, caprice or want of method and accuracy, Mr Haldane never could get from any of them an exact account of what number of lambs of that kind any of them had from the ewes they sent down. Some of them said they had thriven very well with them, and stood the following winter 1793-4 better than the lambs of their own flock, while others pretended that they had lost many of the lambs, and were afraid they would not do on their hills.

But in the first place, it will be observed, that the spring of 1793, especially after the lambing season, was very severe for some weeks, and a great number of lambs, and even sheep of all sorts were lost; and they acknowledged, they had not lost more of them than of the common kind in proportion to their numbers. And 2dly, it is plain, they were not at bottom so averse to the new kind, because they carefully preserved some of the young tups, and reared them for covering even *prematurely*, or too young; and at the rous they bought them up with keenness for the use of last season, and chose rather to do so than bring down their ewes again to the parks to be covered, or to keep and show an exact account
of

of the produce. In short they are like all other sheep-holders averse to have numbers counted, or to let their management be known, *especially by the laird*; and were unwilling to have it thought that they had been mistaken in their opinions, or arguments, or had yielded to conviction in a matter which in its consequences might lead to raising of their rents, *as they thought*, in case these breeds shall thrive with them. They are men, and like others, wish to keep their trade and secrets to themselves. So it is however, that this part of the plan has made less progress than was wished; and time and patience, which bring about many things, must, it is supposed, be also trusted to in this, till men clearly see their interest in it, and the best way of getting at it. But this is stated, as a specimen of the obstacles with which the introduction of any new thing has to struggle, even where every soft and insinuating method is taken to persuade men,—where the evidence of their own eyes is appealed to—and where the kindness and weight of conviction and authority is added;—and the goodness of the intention towards them is acknowledged.

It may be observed, that it has been all along thought necessary to give the flock here in winter and hard weather additional food, such as turnips, cabbages, and a small hack full of fine hay, which they greedily eat up, and attend regularly to get it at the usual time of carrying it to them. But the quantity was small,—never exceeding in 24 hours a small cart full of the green food,—or six or eight stone of hay. If more is given, they seem to grow lazy, and wait for it, and do not use any exertion to seek for themselves. But a very little seems right, and does them much good; and seems only necessary (where their pasture is proper, and and kept light as it should be), in severe frost and depth of

snow, that entirely covers the ground. The expence of thus preserving and keeping in better order, a small flock of such sheep, will not at an average of ordinary years, exceed 1s. or at most 1s. 6d. per head through the winter. And many years it will be done for much less, when the winter is very mild, and when plenty of green vegetables are provided. Indeed they prefer grafs their natural pasture to every thing else, and it is chiefly when they cannot get at it, that they will taste the other, unless constrained to it, and intended to be kept fat for the butcher. It has been found that throwing a handful, or more of salt upon their hay, or on the vegetables, makes them more fond of them, or even laying them upon some tiles in the park, and it probably tends to keep them in better order, especially if the weather continues long wet, or any part of their pasture should at all become so.

If it should be asked, how stands the accounts as to profit and loss, on keeping such a flock of these sheep? It may be readily answered, Mr Haldane has certainly hitherto gained nothing, in point of profit. This was truly not so much his object, as to find out, whether this breed of sheep could easily be reared and would thrive on, or near the hills in this country. The purchase of sheep bought, and expence of bringing them, and of maintaining them, at rather more trouble and charge than will or can be commonly bestowed, and not having in view to make the most of them in every shape, certainly enflamed the reckoning; and not having had yet time, or sold so many, or so regularly, or at such prices, as might have been according to intrinsic value, perhaps has prevented profit, and it may even in some degree be doubted, whether ground at 25s. per acre can profitably be used in that way, unless upon a larger and more established

blished scale, with a more ready market, and a most economical plan of management. The grounds might without doubt have been more profitably employed in tillage, or in grazing cattle, and this must continue to be the case, till a more perfect system shall take place, and till the prices of such sheep, and of the fine wool they produce, shall rise nearer their real worth, and to the prices got in many parts of England, where ground of even superior value is profitably employed in that way: But let us begin, and go on by degrees; without attempting at once to carry flocks of these sheep to the tops of our stormy or bare hills; there is an immense quantity of ground every where through this country, in our swelling and uneven but sheltered surface, which at present does not yield near the half of that rent, and only approaching to, or half way up our hills, much more fitted for feeding sheep of that kind than for any other use: and if once the demand for finer wool comes to take place, and larger mutton shall be found to be more profitable in the common market, or for the consumption of the lower orders and manufacturers, as it most undoubtedly is, it seems perfectly clear, that these sheep must be introduced and prevail. And that the landholders, farmers, and sheepholders and the country in general, must therefrom derive great benefit. It is sufficient for Mr Haldane that under the auspices of the society, he has endeavoured to contribute his mite towards that good end. And as for profit, he is contented at present to forego it, or that he has not lost, till the gradual improvements of the country, in this and other respects, shall happily arrive, and amply repay to him, or to those who may come after him, what he may have laid out from laudable motives, for the good of the country.

Upon the whole, this conclusion may safely be drawn from
what

what Mr Haldane has thus endeavoured to do, That the breed of these fine woolled sheep may easily be reared in this country, particularly in low midland enclosures, where there is good short fine grass, dry ground, and pasture, and accommodation fitted for them; and that *there*, they will be more valuable both as to carcase and wool than the common breeds of the country, and as fattening sooner, and being saleable at three years old: and if every landed proprietor, who has, or might easily obtain such enclosures, especially of a large size, would keep some of these fine woolled kinds, a large quantity of fine wool might be profitably produced, and a great deal of money saved that annually goes out of the country for wool and fine cloth;—And thus a beginning might be given to woollen manufactories amongst us; which being the source of much industry and employment for young and old, and of much wealth, and affording use for what now is, and may be more a native and plentiful material, produced in the country, ought ever to be considered as a staple commodity deserving our utmost attention and encouragement; and we might flatter ourselves in time not only to furnish cloth for our own consumption; but to see two, or three millions of money brought into this country annually, as happens at this moment in *Yorkshire alone*, the reward of their superior industry and attention. We have many advantages to tempt wealthy, skilful, and adventurous manufacturers to settle among us, where they will find low wages,—all the necessaries, and comforts of life in plenty, as well as coal and command of water for every sort of machinery, and the most convenient both land and water carriage, if we will only do so much justice to ourselves as to produce the material wanted, which it is entirely and easily in our power to do.

All the attempts hitherto made in this country to establish woolen manufacturies have hitherto failed, because we had neither proper stock or skill, or the necessary material of finer wool, without a due mixture of which, no cloth of any consequence can be made. And if it is clearly for our interest to renew these attempts, on a more sure footing, it can only be done by introducing and propogating the fine woolled sheep among us. (Signed)

GEO. HALDANE.

No. 6.

Auchtertyre 10th. Oct. 1795.

*AGRICULTURAL OBSERVATIONS on the speediest return of
Lands in the Highlands, by Mr ROBERTSON of Lude.*

IN order to bring land from the worst state of cultivation by the shortest and most effectual means to the highest state of improvement, at the least expence of labour and outlay of money, the following practice has been followed by Mr Robertson of Lude for several years. But first it may be necessary to mention that he has the advantages of a large stock of sheep, a considerable quantity of the best shell marl, and a dry sharp soil to work upon mostly covering lime rock.

When any portion of land on the above estate falls into the proprietors hands from the management of the late tenants, he has found that for the arable land alone on an average, 10s. per acre could not have been produced by letting it in the former plan; and therefore considering the means he had of improvement at an easy rate the following simple mode has for several years been successfully pursued.

1st.

1st. In some instances when entering to the arable land at Whitsunday, artificial grasses were sown with the tenant's infield crop and a crop of hay, at once produced worth £ 3. per acre. When pastured for two years and a top-dressing of marl it has been since let at 30s. in pasture from Whitsunday to Martinmas, and part of the foggage and spring grass reserved for the sheep. But the general mode which is found most profitable has resulted by taking the land immediately from the tenants, when the grass is entered to at Whitsunday and the arable at Martinmas, the foggage of both produce a considerable fore hand rent—or the arable part may be ploughed in order to prepare it for turnips next year, which is the great object. Next year at the proper season (July) the turnips are sown with no other manure than about 80 bolls of marl—They are sown in drills and regularly weeded. In the months of Oct. and Nov. the marl appears to have an effect on their growth; so that they continue to improve till the severest frost sets in. In the mean time, as the hogs* of the flock begin to be affected by the braxy, an immediate check is put to that destructive disorder by putting them on the above turnips—hurdled in different divisions—with a hack of hay placed on the poorest part of the inclosed ground, within each division of the field set off by the hurdles, to which they resort, when oversatisfied with the turnips. At the same time they choose the heights and poorest parts of the land to lie upon, which has the immediate effect of making those the richest parts of the field.

In some parts, in the prosecution of this plan, the expence is very considerably increased by the prodigious quantities of stones which must be removed, even after the marl is put on and the turnips sown, but in the spring following the hurdling

* Sheep between 6 and 12 months old.

ling, the land is found in the best state for the production of a crop of barley and grafs feeds; which should be sown something earlier than usual on account of the luxuriancy of the expected crop: And this for many years from the extent of from 5 to 12 acres has been found to prove the best crop on Mr Robertson's farm. While the hay-crop the three following years is worth L. 5 per acre, and afterwards in pasture will let at L. 2. per acre. Thus from run-rig and unproductive land, hardly (if ever) repaying above the feed and labour, it is turned in the proprietor's hands from foggage to turnips, from turnips to grafs, in the course of two years; by which the land is at once quadrupled in its value; and by a fair calculation of one year with another, all expences are paid by the 2d or 3d crop: Because the advantage to the store farm in saving so many sheep, and raising them to a larger size, should be considered. Besides many improvements on this plan may still be adopted, by following the modes pursued by the growers of rape-feed, which would produce excellent provender not only during the winter but in spring at a time when the sheep stock is in the greatest necessity—especially in the present instance where the greatest disadvantage which has yet been found to attend sheep farming, in the Highlands proceeds from the backwardness of the spring, when in the months of April and May the whole flock is seen to suffer; whereas were any production found to succeed by which the ewes could be properly supported at the time of lambing, the greatest benefit to the whole stock would result. By such a crop another very lucrative branch of sheep farming would be obtained, by carrying on the hill stock of wedders till the common hill mutton be fit for the market, when mutton is at the highest price and hardly to be procured in the markets.

N. B. These practical observations are mentioned with a view of bringing a practice into more general use in Scotland, which has long been productive of the greatest benefit to several counties in England.—And it is satisfactory to observe that when in one of the highest situations of the Highlands this profitable mode can be attended with success, there is every reason to expect it in a superior degree in lower and more fertile situations, by climate and situation.

W. R.

No 7.

A PROPOSAL for RECRUITING the ARMY and NAVY without much expence to government, so far as it extends ; and at the same time, a check to lesser crimes.

NOTICE has been taken, in the foregoing report, of the extension of the jurisdiction, conferred by a late act of the legislature, on his Majesty's Justices of the peace ; and the salutary effects of that act have been pointed out. When the full benefit of this statute is properly understood, there is little doubt of their authority being farther extended even in pecuniary transactions. But there is a matter of police equally needful, congenial to the original institution of these magistrates, which, in the present circumstances of the country, might be committed, with the utmost propriety, to their charge. It is no less evident than lamentable, that a licentiousness in principle and practice has gone forth, which spurns at all legal restraint, which is becoming uncommonly audacious and is making such wide strides that it threatens to level with the ground, the most venerable institutions of
our

our fathers, that have hitherto been the pride of our country.—This monster was deemed such a foe not only to the welfare but to the very existence of society, that he was accustomed to love concealment; but now he shows his face in open day. Such practices affected darkness and secrecy; but now they are daring and avowed. So few were infected by this contagion, that they were either ashamed or afraid: and the ordinary course of the law was sufficient to preserve the peace of society and the police of the country.—But these times are gone. The mildness of the law is insulted; and an ungovernable spirit has arisen, which tramples upon order and upon morality. Our affluence has engendered a train of evils.

In such cases, the gentlemen of the country are the natural guardians of its internal peace and prosperity, acting under a commission from the chief magistrate. The infection is not universal, nor the disease incurable, otherways we were undone. But the distemper is so alarming and the symptoms of its progress so strong, that it requires a remedy which ought to be both speedy and effectual.

There is a gradation of guilt and a variety in the aggravations of crimes, undescribed in any code of laws, which is indefinite, if not almost infinite; therefore justice and sound policy dictates that there ought to be a gradation of punishment corresponding to the various shades of depravity, in the transgression. Death or transportation correspond not to this variety; in some instances, either of them may be too high; in others the last may be too low: the first can hardly be called a degree, because no punishment can be higher; and by the last, the public lose at least all the redress, to which they are entitled from transgressors. Imprisonment for a limited time or the pillory have only a tendency to banish

all shame, if any remains, and to harden culprits in wickedness. And they know, as well as their judge, that for want of sufficient funds to support them in jail, they must soon be liberated, and allowed to go about their business. Banishment from the liberties of a city or from the limits of a county is not only nugatory, but prejudicial to the body politic. Solitary confinement and being put to hard labour is by far preferable to this puerile and short-sighted kind of exile. But Bridewells are not frequent; And can nothing be done in the mean time, to supply their place, in supporting the police of the country? There certainly can. Are we to sit with our hands across, till infection deluge the land, and chaos reign without controul? Enlarge the powers of the justices of the peace. They have firmness; they have integrity; they have a soundness of understanding equal to the task; they know the situation of the country and the character of individuals; and they have the interest of the community at heart. Their own stake is great in the general prosperity. If the powers, they already possess, are sufficient for the purpose, (for they are not accurately defined in some respects) so much the better. Let these gentlemen be instructed to act in a *censofial* capacity, in their provincial meetings of which there are nine in this county, that are already established by law and held regularly once every month. In their judicial capacity, their decrees are much respected and have been the means of a great saving to the public so far as their authority is extended; and it is the general wish that their powers were extended beyond 3 l. 6s. 8d. Let their *censofial* jurisdiction have respect to the morals of the people within their respective districts. Let all the variety of petty trespasses, which never do come to the knowledge of the public prosecutor, as deserving exile or the deprivation of life, nor even to the knowledge of the judge ordinary of the bounds,

come

come under their cognizance : Such trespasses, as the law has provided no other remedy against, except imprisonment or some arbitrary punishment of that nature. Regular lists of the persons guilty of these petty crimes may be transmitted once a year to the head courts in the different county towns : and if cause cannot be shown, why such names ought *not* to be registered in the general county-list ; there they ought to remain until there be occasion for men to recruit the Army or Navy.

By this expedient several thousands of recruits might be got in a few days. Persons who were not only useless, but a nuisance to the community, in one capacity, would be rendered serviceable in another : and those who make a sport of the lenity of the civil law, would be brought under the stricter discipline of military institutions. A vast sum might be saved by government, which otherways would be issued for bounty money. The awe of such a regulation, if vigorously executed, would tend to check licentiousness. The lash would be constantly held over the head of evil doers. Every industrious man, who wishes to earn his bread in peace and security would sit undisturbed. Justice would run down our streets as a stream and the happy effects of a well regulated police be universally felt and applauded by all good men.

The minute particulars of such a regulation it is unnecessary at present to point out. If the hint is taken and the plan adopted, the detail of these may be easily made by professional men. There seems to be but one objection of any weight against this scheme : viz. that it may seem to trench on the liberty of individuals. This objection is more specious than solid. The plan proposed is much milder, because it is slower in its effects, than a comprehending act, which is sometimes
adopted

adopted in the spur of the occasion, and less partial in its operation, by being slowly executed: And these individuals to be affected by it, are the gangrened members of society, and such as have forfeited the protection of the law, by being hostile to it, by their evil practices.

No 8.

A LETTER by Mr James Wright Smith and Ferrier at Crieff, concerning the GLANDERS in horses, addressed to the Reverend Dr Robertson at Callander.

Crieff 23d April, 1796.

SIR,

ACCORDING to your desire, I send you the following observations, extracted from a copy which I sent to Sir John Sinclair, along with the certificates relative to the mares, horses and foals which I have cured of the glanders; which certificates I hope will be an evidence that few persons have hitherto ever had it in their power to set forth. Whether the board will reward me according to the merit of the discovery, I do not know; but I am determined without a proper recompence not to make the cure public.

Your inserting the letter into your report will in a great measure make known to the public where they may have a cure performed, if taken in proper time.

Many persons of skill have written upon the diseases incident to horses, but differ greatly in their opinions, and in none more than in the seat and cure of the glanders. Some persons

persons allege that there are seven kinds of this disease; but if there are, it is more than ever I observed.

This distemper in horses originates from the following causes: by riding or working them excessively; by infection (as it is epidemical), such as by feeding with foul horses, either in stables or at grass; by changing them from warm to cold, comfortless or damp stables; some times by removing them from cold houses to warm ones. A surfeit in feeding has been known to bring on this disease.

The way in which horses are as ready as any, to be infected with it, is, when they are feeding with a foul horse at grass: when the horses not infected happen to be fond of the foul horse, smelling often at his nostrils and catching some of the glandered matter which he discharges. In such a situation few horses will escape the infection.

The first symptoms of the glanders are commonly observed by a hard dry cough, the horses discharging clear water from the nose; afterwards they discharge white or yellow matter; and if it be of a malignant kind, they will discharge matter, streaked with black and blue mixed, and also a gluey substance, that sticks all round the nostrils. All these last mentioned are bad symptoms of the distemper, not easily removed, unless, the cure be taken in time; and the disease generally proves fatal, if it has corroded the spongy bone, which lines the nostrils, or if it has been of such a long continuance as to have affected the lungs. It is not common however that they are thus affected, except when the disease has come to a great height, and that the malignant matter has been allowed to breed ulcers, which affect the nose. When this happens to be the case, there is little hope of recovering the horse.

There are few I believe, who are in the practice of curing
or

or even of attempting to cure this disease, therefore most men do not know much about it; but from the long experience and success, which I have had in the business, I have no difficulty at first sight of knowing this disease, or the slightest appearance of it.

I was desired by Sir John Sinclair to send him a few certificates of the cures which I have performed upon horses, afflicted with this disease, which accordingly I have done. They may be about the number of 130 or 140 horses, mares and foals, which I had the satisfaction of curing of that fatal disease within these 20 years. Many more I could have produced, had the gentlemen and others, I was employed by, been in life at this time.

The above certificates prove that I have cured of the glanders the number mentioned of horses, mares and foals, of all kinds and ages; also mares with foal, and the foals themselves, after the mares had dropt them, even before they were a month old.

I can also certify that all the horses, mares and foals, which were cured by me, will neither communicate the disease to others, nor be in the least danger, so far as I have learned, of being themselves infected a second time, although they should be pasturing, feeding or working with the most corrupt, rotten, glandered horses in the world.—It is like the small pox, they cannot take it twice, if cured.

I apply medicines both externally and internally, before the disease or corrupt glander be removed with safety. And it is worthy of remark, that horses thus cured have seldom or never afterwards been known to have any disease incident to horses. The cure is commonly completed in a few weeks, and all the medicines used for that purpose can be bought at a very trifling expence; and during the time that the
horse

horse is under cure, there is no necessity for keeping him idle, except for a few days.

After the certificates which I have sent to the Board of Agriculture, it is unnecessary to say, that I have been in the habit of curing the glanders for several years; and it is a fact, known over all this part of the country, that the curing of that disease has not been tried successfully by any other person that I know of.

This distemper is not near so frequent here, as it was 20 years ago; because, in my opinion, the farmers in general have got a breed of horses more equal to their work; the horses are better fed and kept clean, and the stables are more comfortable; which do all contribute to the health of horses.

I am,

SIR,

Your most obedient servant,

JAMES WRIGHT.

No. 9.

Heads of a bill for abolishing THIRLAGE, Drawn up by a gentleman in the county of Perth and presented to the Board of Agriculture.

SIR,

YOUR public spirit, and the important services you have already done your country, are beyond my praise. As president of the Board of Agriculture you will have it in your power still further to execute your laudable undertakings, and I reckon it the duty of every individual not only to thank, but to suggest to you what may occur to him.

B b b b

Among

Among the list of enquiries to be made, by the surveyors of the different counties in Scotland, for the Board of Agriculture, I observe one, upon which I beg leave to trouble you. It is the 34th: "Are there any obstacles to improvements, and in what manner can they best be removed?"

One great obstacle to improvements in agriculture is the Servitude of Thirlage. It influences farmers to follow improper rotations of crops, is a great discouragement to the improvement of muirs and waste lands, as perhaps the 12th part of the produce will go to the mill of a stranger, who pays nothing for the improvements, besides it is a perpetual source of law-suits. I am proprietor of some lands in Perth-shire, every inch of which is thirled to two different mills. The trouble and law-suits in which this thirlage has involved me and my tenants I have felt to my cost. Many different parts of Scotland groan under the weight of this servitude, as I make no doubt you will be informed of, when the different Surveys are completed.

The remedy I would humbly suggest (you will pardon me for doing it) is, that the Board of Agriculture should propose and recommend a bill for Scotland, somewhat in terms of the imperfect heads of one, which I take the liberty to inclose. I do not think that any person could reasonably oppose it, and thousands would feel the benefit of it. If you favour me with an answer, please direct to me, of *Murray's-hall* by Perth. I am,

SIR,

Your most obedient,

Humble Servant,

JOHN MURRAY.

Murray's-hall, }
Jan. 8th 1794. }

Sir John Sinclair Bart.

Some

Some Heads of a Bill respecting Thirlage.

Whereas the servitude of thirlage, or the astringing the the corns produced on one proprietor's land to be grinded at the mill of another proprietor, is a practice that has been found to have very bad consequences in Scotland, being productive of innumerable frauds and law-suits, and a great hinderance to improvements in agriculture, and ought to be abolished, Be it therefore enacted, that from and after the day of any proprietors of land so astringed are hereby empowered to purchase such thirlage from the proprietors of the mills. And where the mill shall happen to be under an entail, the money got by such sale to be laid out for the uses of the entail.

In case the proprietor of the mill, shall not be satisfied with the price offered to him, or shall refuse to treat; the proprietor of the lands astringed shall apply to the sheriff of the county, who upon such application is hereby authorized and required to summon a competent number of discreet substantial and disinterested persons not less than thirty, nor more than forty, to come and appear before him at such time and place, as by his warrant and precept shall be directed, and out of such persons so summoned to name and appoint a jury of fifteen persons, and to receive such evidence as shall be brought before him and them, which evidence shall be examined upon oath, and such jury shall determine the price to be paid by the proprietor of the lands astringed.

In case the mill shall happen to be under lease, the jury are to determine what deduction the tacksmen is to have out of his rent for the thirlage so sold. And if the purchaser of the thirlage shall have his lands under lease, the jury are

to determine what additional rent his tenants are to pay for their freedom from the thirlage.

And it is hereby expressly declared that this enactment shall in no way apply to the thirlage established in royal burghs, which is reserved to them entire as formerly.

No. 10.

ROMAN ANTIQUITIES in Perthshire.

ARDOCH. The Roman camp at Ardoch was probably established during the fourth campaign of Agricola in the year 48. It could contain 26,000 men, according to the ordinary distribution of Roman soldiers in their encampments; the contents being 1060 feet in length, and 900 in breadth.

From Ardoch to Strathgeath at the distance of five miles the Roman road was directed north-east. The works, which the Romans erected at this place, have been demolished by the progress of cultivation. Here they crossed the Earn. At Strathgeath and not in the neighbourhood of Kinross, as is generally supposed, did the Caledonians surprize the Romans, whom they would have defeated, had it not been for the seasonable arrival of Agricola, with the ninth legion, by break of day from Ardoch, upon receiving intelligence of the critical situation of that detachment.

The Roman road stretches eastward from Strathgeath behind the house of Gask, being regularly 20 feet wide, visible where the ground has not been cultivated, and having circular posts for centinels at proper distances and a station at Gask. In this direction it reaches Bertha, which is situated on a point of land, formed by the confluence of the

the

the Tay and Almond, and about 14 miles from Strathgeath, At Bertha the remains of a timber bridge are to be seen, consisting of stones and beams, on which the Romans passed over the Tay to Strathmore.

About 3 miles north of Perth and on the east side of the river, they established another station at a place called Grassy-walls, so named from the remains of the mound, within which it is situated. Grassy-walls is about twenty miles from Ardoch. The road then passes a place called Rome and is continued through St Martins, of the same breadth as it is at Gask. In the same line of march is the Roman camp at Lintrose near Cupar of Angus, which is 1900 feet long and 1220 feet broad.

From thence they seem to have prosecuted their rout, in the bottom of Strathmore, by Meigle, nearly at an equal distance from the Seedlaws on the right and from the Grampians on the left, to a place called Battle-dykes east of Kirmuir. Both this station and Grassy-walls and Lintrose seem, by their extent, to have been capable of containing the same army, as the camp at Ardoch. The probable scene of Agricola's famous engagement with Galgacus and his Caledonians appears to be near Fettercairn: and this probability is supported by a variety of circumstances, which are applicable to no other station.

Different hypotheses have been adopted relative to the place, in which this obstinate and bloody battle was fought. Some insist that it took place at Dalganrofs, about a mile south from the church of Comrie, and eight miles from Ardoch. This encampment is 1020 feet long and 900 broad, and evidently Roman. But Agricola engaged in sight of his fleet, and after the action, retired to the country of the Horesti, which was Forfar-shire.

Others

Others contend that it was fought near Inchtuthil, eleven miles north of Perth and a little west of Blairgowrie. This place was probably insulated at that period, by the Tay, a circumstance which would not have been omitted by such an accurate historian as Tacitus. The Roman camp in this place could hardly have contained Agricola's army; and although it be nearer to Forfar-shire than Dalganrofs, it is equally hid from the sea. Inchtuthil seems to have been, either one of the out-posts of Agricola, during a war, which required all his vigilance and exercised all his military skill; or it was constructed by some Roman general, posterior to Agricola, probably by Lollius Urbicus. The appearance of circular works in this place shows that either the Picts or Danes may have settled here after the Romans.

There is an intrenchment at Fortingal in a plain betwixt the house of Glenlyon and the bridge, which contains 80 acres of ground, and has all the appearance of being Roman, if we can suppose, that they would have ventured so far into these narrow defiles of the Grampians, surrounded on all hands with thick forests and rapid streams in the face of an intrepid and enterprising enemy.

At Callander there is a place nearly of a semicircular form, called a Roman camp, the area of which consists of about 5 acres of ground. The diameter is formed by the river Teath and the curve by a serpentine bank of uncommon beauty, adorned with a variety of trees. Whether the natural strength of this place might have induced the Romans to have fixed a temporary station there cannot be determined with certainty, but the agger is evidently a *lufus naturæ* or any thing rather than an intrenchment of the Romans,

No. II.

ECCLESIASTICAL ANTIQUITIES of Perthshire.

INCHMAHOME, in the Loch of Monteath or Loch of Inchmahome, was an Abbey, said to have been founded by Murdoch Earl of Monteath, who was killed at the battle of Duplin in 1332; but it was founded before that period; for the Prior of the Abbey swore fealty to Edward I. in the year 1296.

This abbey belonged to the Canons of Cambus-kenneth. It was united by James IV. to his royal chapel at Stirling; but was disjoined therefrom by James V. and bestowed on John Lord Erskine, who was for some time Commendator thereof, and afterwards created Earl of Mar by Queen Mary and chosen Regent in 1571, after the death of the Earl of Lennox.

INCHAFFRAY was an Abbey founded by Gilbert Earl of Strathearn in 1200; the Canons whereof were brought from Scoone. Mauritius (Maurice) abbot of this place, was present with Robert Bruce, at the battle of Bannockburn, in the quality of chaplain; to which he brought the arm of St Fillan. The Scottish army kneeled down to receive his benediction, whilst he walked barefooted along the ranks, bearing a crucifix in his hand. Whereupon Edward cried out, "They implore mercy." Umfraville replied "They do, but not ours: On that field they will be victorious or die."

This monastery was erected by James VI. in the year 1607 into a temporal lordship, in favour of James Drummond,
son

son of Lord Drummond, by the title of Lord Maderty. Srathfillan and Abernethy in this county and Scarinch in the Isle of Lewis were cells or priories, belonging to Inchaffray.

STRATHFILLAN, in the western extremity of Perth-shire, was a priory, founded by Robert Bruce and consecrated to Saint Fillan, in gratitude for the assistance, which he had from that saint at the battle of Bannockburn in 1314. This priory, with all its revenues, was given at the Reformation to Campbell of Glenorchy ancestor to the Earl of Breadalbane, in whose possession it still remains.

ISLE OF LOCHTAY, near the east end of the lake, was a cell or priory belonging to Scoone, founded by King Alexander I. in 1122, where Sybilla his Queen, daughter of Henry Beauclerk king of England, died and lies interred. At this place, there is fine fruit of the various kinds, common in those days, which were imported from the Continent by the ecclesiastics, into this country, wherever they got settlements. Remains of these fruit trees are still growing both here and at Inchmahome and many of the other ancient religious establishments in Scotland.

SCOONE was an abbey founded by King Alexander I. in 1114, which had formerly belonged to the Culdees, according to Buchanan.

ABERNETHY is supposed to have been built and endowed by Garnard Macdampnach. It was first a retreat for St Bridget and other nine virgins, into which they were introduced by Saint Patrick, and at the same time the metropolis of the Pictish kings.

Abernethy was a bishopric and the residence of the metropolitan, if not of all Scotland, at least of that part of it which was subject to the Pictish kings, during the existence

of that power: but Kenneth III. translated both to St Andrews in the year 840. At Abernethy was also a convent of Culdees, which was changed in 1272 to a priory of regular canons.

It was remarked in the preceding work, that there is only one other round tower, of a construction similar to that at Abernethy, in Scotland; although they abound in Ireland. Various conjectures have been offered concerning their use; but the most probable is, that they were penitentiary towers, the residence of hermits. The door of this tower, which fronts the north, is $8\frac{1}{2}$ feet high and $2\frac{1}{2}$ wide. It has four windows near the top. The whole height is 75 feet; the circumference at the base is 48; and the thickness of the wall $3\frac{1}{2}$ feet.

ELCHO was a nunnery belonging to the Cistercians situated on the river Tay below Perth, which was founded by David Lindsay of Glenesk and his mother. Madoch earl of Strathearn, gave the lands of Kinnaird in Fife to this nunnery.

PERTH. A monastery of Dominicans or Black Friars was founded at this town in 1231, by Alexander II, who, together with Robert Bruce granted them considerable revenues arising from the imports of Perth and Dundee and from other sources. James I. was murdered in this convent and buried in the Carthusian monastery founded by himself near the city.

The Observantines, a class of Franciscans or Gray Friars, had also a religious house situated contiguous to the walls of Perth, which was founded by Lord Oliphant in 1460. Buchanan acquaints us that this house was destroyed in 1559, and adds with his usual acrimony "*Inventa est apud Franciscos suppellex quidem, non solum copiosa, sed etiam admodum lauta, et quæ decuplo tot, quot ipsi erant, abundè satisfuisset.*"

set. Dominicanis nequaquam eadem erat opulentia; sed certè tanta, ut mendicitatis professionem facile redargueret: adeo ut non inicitè quidam, non fratres mendicantes, sed manducantes eos appellaret." John Knox narrates the different articles of their stores and furniture in his second book, and concludes by saying "That no Earl of Scotland had better."

COUPAR was an abbey of Cisterians founded by Malcolm IV. in the year 1164. These monks were called Cisterians from Cisterium in Burgundy: they were called White Monks, because all their dress was white, except their cowl and scapular: and Bernardines, from St Bernard, a native of Burgundy, who is said to have founded 160 monasteries of that order.

Next to our kings, the Hays of Errol were the principal benefactors of this monastery, who at different periods annexed large grants of land to its revenues. After the reformation James VI. created the second son of Secretary Elphinston Lord Coupar in the year 1607; but he dying without issue, the honour devolved on Lord Balmerino.

ST LEONARDS AT PERTH was an ancient priory founded, according to Prynn, before the year 1296. It was suppressed by James VI. and annexed to the charter house of Perth, which he founded near that city, together with the Magdalens lands.

FOULIS EASTER was a prebendary founded on the confines of Angus-shire, by Sir Andrew Gray of Foulis, ancestor to Lord Gray, in the reign of James II.

METHVEN was a collegiate church, founded in 1433, for a Provost and several prebendaries by Walter Stewart Earl of Athol, one of the younger sons of Robert II.

TULLYBARDIN was an establishment of the same kind,
founded

founded in 1446 by Sir David Murray of Tullybardin, ancestor to the Duke of Athol.

CULROSS was a Cistercian Abbey, founded by Malcolm Earl of Fife, in 1217, dedicated to the Virgin Mary, and to Saint Servanus the confessor, whose festival, on the first day of July, was kept long after the reformation; men and women marching early in the morning round the town with green boughs and spending the rest of the day in festivity.

The earls of Argyle who lived at Castle Campbell, were heritable bailies of this abbey, which office they disposed of to the Colvilles of Ochiltree, in whose hands it was, until the heritable jurisdictions were abolished.

DUNBLANE. The Cathedral of this place is situated on the eastern bank of the Allan and overlooks the town. It was founded by king David in 1142. To this see were annexed considerable revenues in Scotland, besides lands which it possessed in England. The cathedral is unroofed, and going to decay, yet venerably grand, because much of these ruins remain. The west door is a singular piece of masonry, the grooves in the stone being wider within than without. The choir is kept in repair as a parochial church, in which are several oaken seats for the prebends, with grotesque figures carved upon them, particularly a cat, a fox and an owl; which were probably emblematical of the peculiar qualities of these animals, like the ancient hieroglyphics of Egypt.

At the west end of the choir are thirty two of the prebendary stalls; and on the north of the entrance from the cathedral, the Bishop's seat, the Dean's, both of oak, handsomely carved. Several graves of Bishops and Deans, are in the area covered with coarse blue marble stones. Behind a mo-

dern feat is a niche in the wall, in which is placed the figure of a bishop, as large as the life, dressed in his pontificals, with the mitre on his head. The three steps to the altar remain. The length of the building is 216 feet, the breadth 76, the height of the walls 50 and of the tower 128.

DUNKELD. Constantine III. king of the Picts, instituted a monastery of Culdees at Dunkeld, about the year 729, in honour of St Columba, the tutelary saint of the nation, and after the building of the church of Abernethy 227 years, according to some accounts, but according to others 244. These Culdees*, (colentes Deum) were not enjoined to observe celibacy, but followed the custom of the eastern church in that respect, as was afterwards the manner of the church of St Regulus at St Andrews.

David king of Scotland expelled the Culdees from Dunkeld, and changed the monastery into a cathedral church about the year 1127. They are supposed to have continued near one hundred years longer at Dunblane.

This Cathedral was but small, is situated in a beautiful little plain, on the north bank of the Tay, close by that majestic smooth-flowing river, and is surrounded on all hands by hills; a situation delightfully grand and snugly warm in defiance of the disadvantages of the climate. The choir is converted into a parish church; the principal building is in ruins and grown over in different parts of the wall with moss.

No.

* Some derive their name from *Guildich*, retired persons or Hermits.

No 12.

BRITISH ANTIQUITIES in Perthshire.

DUNSINAN HILL, (very aptly called by Sir John Sinclair the *hill of ants*) six miles north east of Perth, being one of the tops of the Seedlaw chain, is 1024 feet above half flood at Panbride, detached from the rest of these hills by a deep valley. The conical summit is covered with grass and the lower parts with heath. The ascent is gradual, except on the south and south east, where it is steep. It was well fortified, being defended by a strong rampart which went quite round the upper part of the hill. The outer works were a fosse on the east, an esplanade on the south and a ledge of rocks on the north east. The area within the rampart is of an oval form, 210 feet long, 130 broad, and a little lower than the ruins of the rampart which surrounds it. The original height of this rampart cannot be ascertained; but from the immense mass remaining that overtops the interior summit of the hill, it must have been considerable. This mass consists of whin and quarry stones, of mortar and slates.

A section was lately made across the hill by Dr Playfair of Meigle; and flags, charcoal and bones of several species of animals were discovered, but no appearance of any building. At the southern extremity of the section was found a pit, adjoining to the rampart, full of fat and moist earth, loose stones, burnt wood and bones of black cattle, sheep and hares, &c. but none of the human body.

Having penetrated seven yards horizontally into the heart

of

of the mass of stones and rubbish, which had composed the fortress and surrounded the area, part of the wall of the rampart was discovered, quite entire. It is nicely built of large stones, bedded in clay or mortar. The entire part of the wall is 5 or 6 feet high. Upon making incisions into other parts of the rampart, the wall was found in the same good preservation, quite round the whole fortress, having been protected, since the middle of the eleventh century, from the injuries of the weather and the waste of time, by seven yards of rubbish grown over with a green sod; and the declivity of the hill prevented any stagnation of the rain water. Were this rubbish removed from the outside of the rampart, all round, Macbeth's fortress on Dunfinnan hill would be one of the most remarkable monuments of antiquity in Britain.

Whether Macbeth was slain at Lumphanen in Aberdeenshire, two miles west from the village of Kincardin o'Neil, where there are vestiges of an ancient fortress of an oblong figure, nearly 100 yards long and 20 yards broad; or whether he threw himself, in despair, from the top of a rock, in the neighbourhood of his own fortification, according to the tradition of that country; or fell by the hands of MacDuff, whom he had greatly injured at Belli-duff, (probably bellum Duffi) a tumulus of earth near Belmont Castle, several miles east from Dunfinnan, it is perhaps impossible to determine.—The Lang (long) Man's Grave is shown on the south east side of the fortress.—Near it, in the parish of Abernethy, is the King's Seat, which may have been a watch-tower, that commands a most extensive prospect in all directions.

Barry-hill near Alyth. On the summit of this hill are distinct traces of a Pictish fortification. The bridge across the ditch is a great curiosity. The stratum of gravel on its top
must

must have been brought from the Isla, as there is none in that neighbourhood. The vitrifications in this fort agree neither with the theory of Williams, nor with that of Tytler.

The tower at Abernethy has been mentioned under the article, Ecclesiastical Antiquities.

There are many *Druidical temples* or circles of stone. About a mile east from the Castle of Taymouth, there is one very magnificent and entire, consisting wholly of single blocks of stone, all set upon end. One of a similar construction, but of a less size is at Kinnell, the seat of Francis M'Nab of M'Nab, near the west end of Loch-tay. There is one at the village of Comrie: another at Inchbrakie, east from Crieff.

In Strathardle and parish of Kirkmichael, there are several Druidical temples, on a heathy moor which are constructed differently from these. One of them consists of two concentric circles of stones rudely built, and many of one circle constructed in the same manner. The outer circle of the first is 50 feet in diameter, the inner circle 32 feet: the last are of different dimensions, from 32 to 36 feet in diameter, and some less.

At Coupar Grange two miles north of Coupar there was discovered some years ago a Druidical temple of a construction similar to the greatest one at Kirkmichael, and nearly of the same dimensions. The diameter of the inner circle was sixty feet. The wall itself was five feet high. At the distance of nine feet, an outer wall of the same height was carried round. The space between these concentric circular walls was filled with ashes of wood and bones of different animals, particularly sheep and oxen. A paved way led across the area from west to east, to a large free stone, standing erect between the circles and rising $4\frac{1}{2}$ feet above the pavement.

pavement. This stone, which seemed to have been the altar, was flat at top and 2 feet square.

On the top of Benledi, a high mountain near Callander, the Druids celebrated an anniversary every summer, of which there is some account given in the Statistical Account of the parish, vol. XI. but there are no circular walls nor circles of stones in that place.

CAIRNS. In the parish of Clunie there are Herculean works known by the name of *Hiers Cairns* (probably Heroes Cairns), concerning which there is no tradition, that I could meet with. There is a large cairn on the confines of this county in the road to Inverness. On the same moor in the parish of Kirkmichael, where the Druidical circles are, there is a cairn 90 feet in circumference, 25 feet high and 32 feet broad. A great number of smaller cairns are collected in different parts of this moor, which are generally in groups of eight or ten in one place. From the east side of the great Cairn, two parallel stone fences or rude walls are carried, upwards of 100 yards southward, both of which are bounded in that direction by small Cairns, and seem to form an avenue to the great cairn.

Similar collections of field stones are met with in many parts of this county. In some instances they were gathered off the land, where it seemed to be fit for tillage: In other cases they seem to have been monuments of some great event; which practice prevailed universally among rude nations, before the invention of written records. They were often the sepulchral monuments of great men, raised by the piety of their friends, the size being in all cases, in proportion to the respectful veneration of posterity. A very strong and lasting promise of friendship to this day from a Highlander is, "I will put a stone into your cairn."

ROCK-

ROCKING STONES. The rocking stone of Dron is 10 feet long and 7 broad, standing in an inclined position. When it is pressed gently on the higher end, with the finger, it moves in an arch of betwixt one and two degrees: which motion continues for some time.

There is another stone of a similar construction at Balvaird, two or three miles east from Dron, on the water of Farg, mentioned by Buchanan; but it does not now move.

Another of these stones is in the parish of Kirkmichael, situated on the moor abovementioned, which has a quadrangular shape, approaching to the figure of a Rhomb, of which the greatest diameter is 7 feet, the least 5 feet. By pressing down either of the extreme angles, a rocking motion is produced, which may be increased to a whole foot: and after the pressure is withdrawn, it performs 26 vibrations or more, before it rests. Near to this rocking stone are a number of Druidical temples similar to those abovementioned, consisting of two concentric circles, with a single circle of less dimensions adjoining to each of them on the east.

It is not improbable that the rocking stones were used either for the purposes of superstition, or for decision in judicial trials; and that the issue corresponded to the intention of the judges.

LOCH-TUMMEL FORTRESS. At the west end of this lake is a peninsula, which had been separated from the main land by a deep ditch. This was the strong hold of Duncan, who was ancestor to Robertson of Struan, and founder of the family. Here he received Bruce and his suite after the disastrous battle of Methven, when few had the courage to espouse his cause. Many vestiges of temporary habitations and names of places in that neighbourhood allude to the king's having found an asylum for himself and his followers

for some time under Duncan's protection. At Dalchoshie, (the field of victory) Bruce's friends defeated the partizans of Edward.

In Athol, Breadalbane, Glenlyon, near Callander, and in many other places, there are vestiges of watch towers to communicate intelligence, and alarm the country on the appearance of an enemy.

DOUNE CASTLE. The first mention that is made in any record of this castle, is by Sir James Stewart of Beath being appointed constable thereof by James V. The son of this Sir James obtained in 1565 a charter under the great seal, of certain lands, by the name of the barony of Doune. He was a steady friend to Queen Mary, during the civil wars; at which period this castle afforded a safe retreat to the loyalists. Before the abolition of heritable jurisdictions, courts were held in the great hall of the castle, which fronts the north. In the rebellion 1745, it was occupied for some time by the rebels, who planted a 12 pounder in one of the windows, and several swivels on the parapets, which had been taken from a merchant-ship.

CASTLE CAMPBELL is built in a most romantic situation; above the village of Dollar, on the south face of the Ochills, having vast mountains in the back ground and on either side. This venerable pile looks down on a vast tract of country, and stands on the point of a peninsulated rock, with deep glens on the right and on the left, shagged with brushwood where the shelves of the ravines have any soil. The naked rocks pointing out through the trees, the noise of the waters in the bottom of the chasms, the depth and gloominess of the dens, conspire to increase the horror of a spectator looking down from this wildly romantic place, and have given it the dolorous title of the *Castle of Gloom*, being bounded by
the

the *Glen of Care*, and the *Water of Sorrow*, and looking down on Dollar (*darkness*).

From the Castle to the water, there was cut, in the solid stone, a subterraneous passage by an incredible number of steps, which is now visible through the bushes in the face of the rock, awfully dreary and terrible to behold. Castle Campbell was burnt by the famous marquis of Montrose in 1645. It belongs to the Duke of Argyle, where the family has many superiorities.

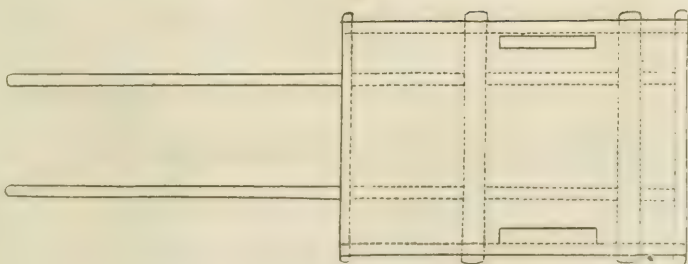
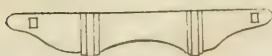
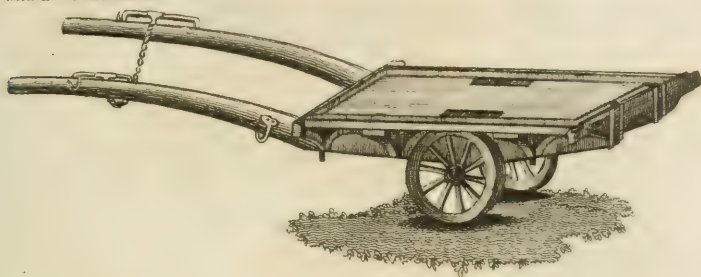
HUNTING TOWER was anciently called Ruthven (Rhuvuin, the red stream) and was part of the estate of Gowrie. It is unknown when and by whom it was built. James VI. on his return from Athol, was confined here in 1582, by a discontented party of his nobility. Ruthven-castle consists of two ancient square towers, which are connected by buildings of a later date. It is the property of the Duke of Athol.

GOWRIE-HOUSE stands on the north-east side of the town of Perth. There is neither record nor tradition by whom or when it was built. This house was the scene of Gowrie's conspiracy, which it is so hard to unravel, in the history of Scotland. Upon the forfeiture, it was given to the magistrates of Perth; and they presented it in 1746, together with the freedom of the town, to William duke of Cumberland. The Board of Ordnance procured it from him, and converted it into Barracks.

CORRIGENDA.

Page 13, line 22, <i>for</i> Leekie,	<i>read</i> Leckie.
— 47, — 4, <i>for</i> bailies,	<i>read</i> bailies.
— 131, — 11, <i>for</i> to be,	<i>read</i> when.
— 211, — 14, <i>for</i> Spring 1796,	<i>read</i> Spring following.
— 232, — 30, <i>for</i> moist,	<i>read</i> moist.
— 292, — 9, <i>for</i> deptn.	<i>read</i> depth.
— 345, — 19, <i>for</i> town,	<i>read</i> towns.
— 348, — 11, <i>for</i> their,	<i>read</i> his.
— 352, — 13, <i>for</i> yearly,	<i>read</i> nearly.
— 371, — 11, <i>for</i> luxurious,	<i>read</i> luxuriant.
— 385, — 17, <i>for</i> there,	<i>read</i> their.
— 449, — 31, <i>for</i> triumphali,	<i>read</i> triumphali.

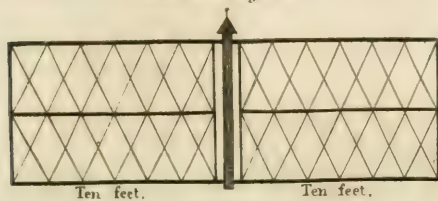
*FORM OF THE CART EMPLOYED IN THE QUARRY OF KINGOODIE FOR CARRY-
ING FLAGS OF GREATER BREADTH AND LENGTH THAN ARE ANY WHERE ELSE RA-
ISED IN SCOTLAND*



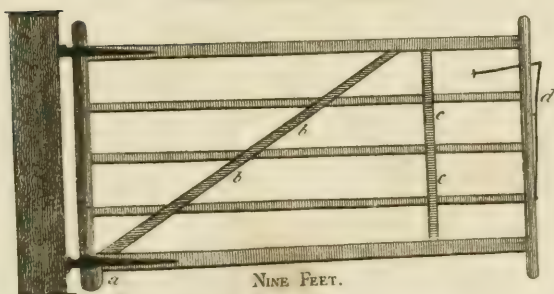
Scale of Feet



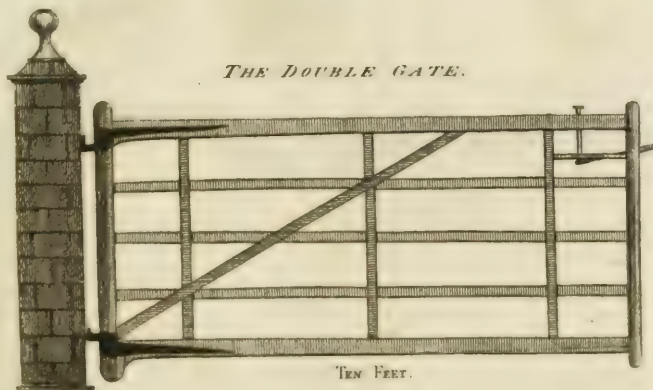
MODEL OF A GATE MOVING ON THE CENTER,
referred to in page 121.



THE SINGLE GATE.



THE DOUBLE GATE.



Machine for raising large Stones on Carts or Waggon's to be carried off a field without being blown or broken.



Fig. 1.

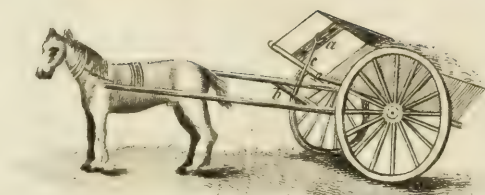
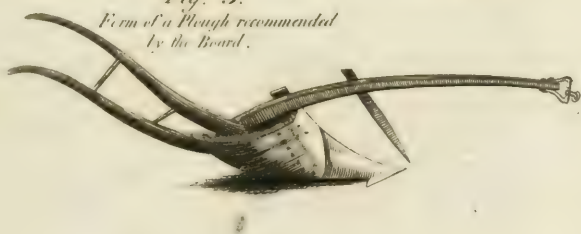


Fig. 2.



Fig. 3.

*Form of a Plough recommended
by the Board.*





I N D E X

Of some of the Subjects treated of in this Survey of Perthshire.

A

AGRICULTURE, practised by the
Ancients, *pages* 7, 8, 9.
—, progress of in
Britain, 10, 11.
—, parent of popu-
lation, 15.
—, makes a nation
independent, 16, 18.
—, knowledge of,
how acquired, 18, 19, 447.
—, old system of in
Perthshire, 63.
—, in what circum-
stances it can flourish, 70, 71.
—, importance of,
445, 446.
—, dignity of, 449,

450.
Animals, proper to be pastured
together, 226.
—, how many on an acre,
227.
—, ought to have changes
of grafs, 226.

B

Barley, culture of, 151, 153, 154.
—, kinds commonly sown,
152.
Baronies, what, 40.
Baron Bailie, powers of, 41.
Beans, 148, 149.
Bees, 332, 333, 334.
Boundaries of estates, natural and
artificial, 49, 50.
Bread, kinds of used, 162, 163.
Buck-wheat, 190.
Burdens, public, 431, 432.
—, of the nation ought to
be fairly borne by all classes, 442,
443, 444.
Byre-law-men or sworn valuers,
40.

C

Canals, 365, 427, 428.
Carrots, 187.
Carts, proper mode of yoking, 102.

Cattle, how best fed with turnips,
pages 183, 306.
—, breeds of in Perthshire,
303, 304.
—, premiums for best breeds,
305.
—, how a new breed may best
succeed, 307, 308.
—, why so many in the mar-
ket, since sheep stocks have pre-
vailed, 310, 311.
Clay Soil, where in Perthshire,
12, 13, 14.
Clover, 214.
Coal, where, 29, 30.
—, singular coal-work in the
Frith of Forth, 31.

Coke, 30.
Commerce, 372—376.
Commissary Courts, origin and
powers of, 47.
Commons, 403.
Conclusion, 445.
Corn Law, 351, 352.
Cottages, 59.
Crops cultivated, 141.
Cultivation moving westward, 14.

D

Declivities, how ought to be
ploughed, 124, 125.
—, former method of do-
ing it, 125, 126.
Deer, 327, 328, 329.
—, ancient mode of hunting,
328.
—, Fallow, 330.
Description of the county of Perth,
453, 454, &c.
Distillery-laws, fluctuation thereof
injurious to agriculture, 151, 152.
—, Illicit, 348.
Draining, 270—273.

E

Eagles, how to be extirpated, 410.
Economy, political, 355.
Embankments, 275, 276, 278,
365—369.

Estates,

I N D E X.

Estates, management of, *page* 37.
 ———, how to be laid out, 119.
 Expende and profit of different
 kinds of farms, 87—91.

F

Factor, business of, and its im-
 portance, 49.
 Fairs, 370, 371.
 Fallowing, 132, 134, 135, 136.
 Fallow Crop, 133.

Farm houses and offices, style of,
 51, 52.

————, an improvement of
 Cow-house recommended, 52.
 ———, Repairsof, how com-
 monly made, 53.
 ———, in clusters formerly
 and why, 62.

Farms, size of, 65, 67, 68.
 ———, why split down formerly
 into small holdings, 66, 67.

Farmers, common prejudices of,
 13.

————, present, general charac-
 ter of, 70.

————, accommodation of, 71.

Feeding, 223, 224, 225.

Fiars, 424, 425.

Fishings, 377, 378, 379.

Flax, soil fit for, 165, 166.

———, culture of, 167—171.

———, quantity raised annually in
 Perthshire, 169.

Foxes, how to be extirpated, 411.

Free-stone quarries, where in
 Perthshire, 35.

Fuel, 352—355.

G

Galloway dykes, 115.

Gardens and Orchards, 227—230.

Goats, why not bred, 308.

Grain, prices of, 346, 347.

Grass, 203, 210, 211, 215, 216.

———, too much of, injurious to
 population, 211, 212, 213.

———, artificial grasses, 113.

H

Haugh, where in Perthshire, 15, 16.

Harvesting, 191, 192, 193, 195, 196.

May-harvest, 217—220.

———, weight of, at different ages,
 221.

Hay, best kind of, *page* 222.

Head-dykes very early made, 108.

Hills, when in tillage, 109.

Hill, how to be dressed, 132.

Hogs, 325, 326.

Horses, 324, 325.

Houses of Noblemen and Gentle-
 men, most noted in the county
 mentioned, 466, 467, &c.

I

Implements of husbandry, 91—100.

Improvement, retrospective view
 of, 60.

————, obstacles to, 392—
 396.

————, how excited, 401,
 402, 437.

————, means of, 411—416.

————, peculiarly adapted
 for the Highlands, 417, 418, &c.

———— of land, a profitable
 speculation, 438—441.

Inclosing in Scotland very early, 105

Inclosures, extent of, 111.

————, nature of, 111, 113, 114.

————, prices of, 112.

————, how expence ought to
 be defrayed, 120.

Iron-Stone in Perthshire, 36.

Justices of peace, powers of, 42, 43.

K

Kavels and Kinches, still in Perth-
 shire, 62.

Kingoodie, singular stone-quarry
 of, 35.

L

Labour, 340, 341, 343.

————, hours of, 342.

Lakes, most noted taken notice of,
 460, 641.

Land unimproved a dead stock, 17.

Leases, old conditions of, 64, 84,
 85, 86.

———, conditions of, ought to
 be binding, 433—436.

———, often inaccurately expres-
 sed, why, 64.

———, indurance of, 74, 75, 83.

———, necessity of, 82.

———, shortness of, injurious to
 improvement, 399.

Lime, 282.

Lime,

I N D E X.

Lime, where imported, *page* 285.

Limestone, where in Perthshire,
32, 33, 286.

——, kilns for, 287.

——, quantity laid on the
acre, 287.

——, pounded raw at Ran-
noch, 33, 283.

——, comparison of raw and
calcined, 284.

Loam, where in Perthshire, 17, 18.

M

Manufactures, 379—383.

Manuring, 280, 281, 298.

——, plants adapted for, 281.

Markets, weekly, 371.

Marle, 290, 291, 292.

——, how produced, 293.

——, rod for boring, 294.

——, little used in England or
in France, 294.

Meadows and Pastures, 204—206.

——, method of flooding,
207—210.

——, proper grafs to be sown
upon meadows, 208.

Measures, uniformity recommend-
ed, 405.

——, table of, 6.

Milk, quality of, affected by Pas-
ture, 225.

Mines, lead and copper in Perth-
shire, 36.

Moor Lands of Yorkshire compar-
ed to Highlands, 26.

Moors, 252.

—— of Orchil, 253, 254, 255.

——, where, that ought to be
planted, 261, 262.

——, profit of planting, 256,
257, 258.

Mountains, most noted in Perth-
shire, 461, 462.

N

New Plants, how successfully in-
troduced, 186.

O

Oats, kind sown, 155, 156.

——, seed time of, 156.

——, reaping season, 157.

——, mode of reaping, 158—160.

Obstacles to improvement various,
397, &c.

Officiaries, what, *page* 39.

Oxen, why not used for the plough,
308.

P

Paring and burning, 274, 275.

Pease, 148, 149, 150.

Perth, county of, singular in vari-
ous respects, 19, 20.

——, Longitude and Latitude of, 1.

——, square miles and acres of, 1.

——, divisions of, ancient and mo-
dern, 2, 3.

——, natural division of into High-
land and Lowland, 3.

——, Climate of, 4, 5, 6.

——, Tables of Hydrometer, Ba-
rometer, and Thermometer, 8.

——, Tables of rainy and fair days,
10.

——, soil and surface of, 11.

Pigeons, 331, 332.

Plants fitted for different soils, 268.

——, food of, 269.

Planting early in Scotland, 104, 105.

——, method of, recommend-
ed, 242, 243.

——, utility of, in respect of
profit, 258, 259.

——, where most done, 263, 264.

Poor, 384, 385.

Poor's Rates, 80, 81.

Population, 387, 388, &c.

——, Table of, 391.

——, causes affecting, 54, 55.

Potatoes, culture of, 172, 173.

——, great importance of, 174.

——, produce per acre, 174.

——, proper soil for, 175.

——, a tender crop, 176, &c.

——, mode of preserving, 178.

——, have been distilled, 179.

Poultry, 330, 331.

Provisions, 345.

——, prices of, 249, 250, 346.

R

Rabbits, 327.

Rape-seed, 187.

Regality Courts, ancient, nature
of, 47.

Rent, increased and why, 71—73.

——, average of, 72.

——, progressive proper, and how
made so, 400.

Rent

Rent, in what payable, *page* 76.
 —, method of renting Grazings,
 72, 73.
 —, how made up in different
 districts, 151.
 Rhubarb, 188.
 Roes, 327, 329.
 Rotation of crops, 136, 137—141.
 —, method of introducing
 a proper one, 190, 197—200.
 Runrig, 293.
 —, long practised, 61, 62.
 Rural economy, 334, 335—338.
 Rye, proper Spring food for ewes
 and lambs, 185, 186.

S

Sainfoin, 188.
 Sandy or gravelly soil, where in
 Perthshire, 22, 23.
 Scarcity, root of, 187.
 Seed, how to choose good, 163.
 Seed-time, how to choose, 164.
 Sheep-fence. 116.
 Sheep, breeds of in Perthshire, 309.
 —, proportion of the county
 under, 311, 312.
 —, breed of, how may be im-
 proved, 313—320.
 —, prices of, 322, 223.
 —, diseases of, 316—321.
 Shealings, 335.
 —, necessary in a certain
 state of society, 339.
 Slates, where in Perthshire, 34.
 Societies, benevolent, utility of,
 386.
 —, for improving agricul-
 ture, 404, 405.
 —, of correspondence with
 the Board recommended, 429.
 Sowing, why earlier in Carle than
 higher ground, 146, 147.
 Stacks, corn, form of, 161.
 Steward, ancient office and powers
 of, 46.
 Stipends, how augmented, 78, 79.
 Stones, machine for raising large
 ones, 279, 280.

T

Tares, 189.
 Tenures, nature of, 50.
 Thirlage, evil of, 396.
 Till, where in Perthshire, 19—21.

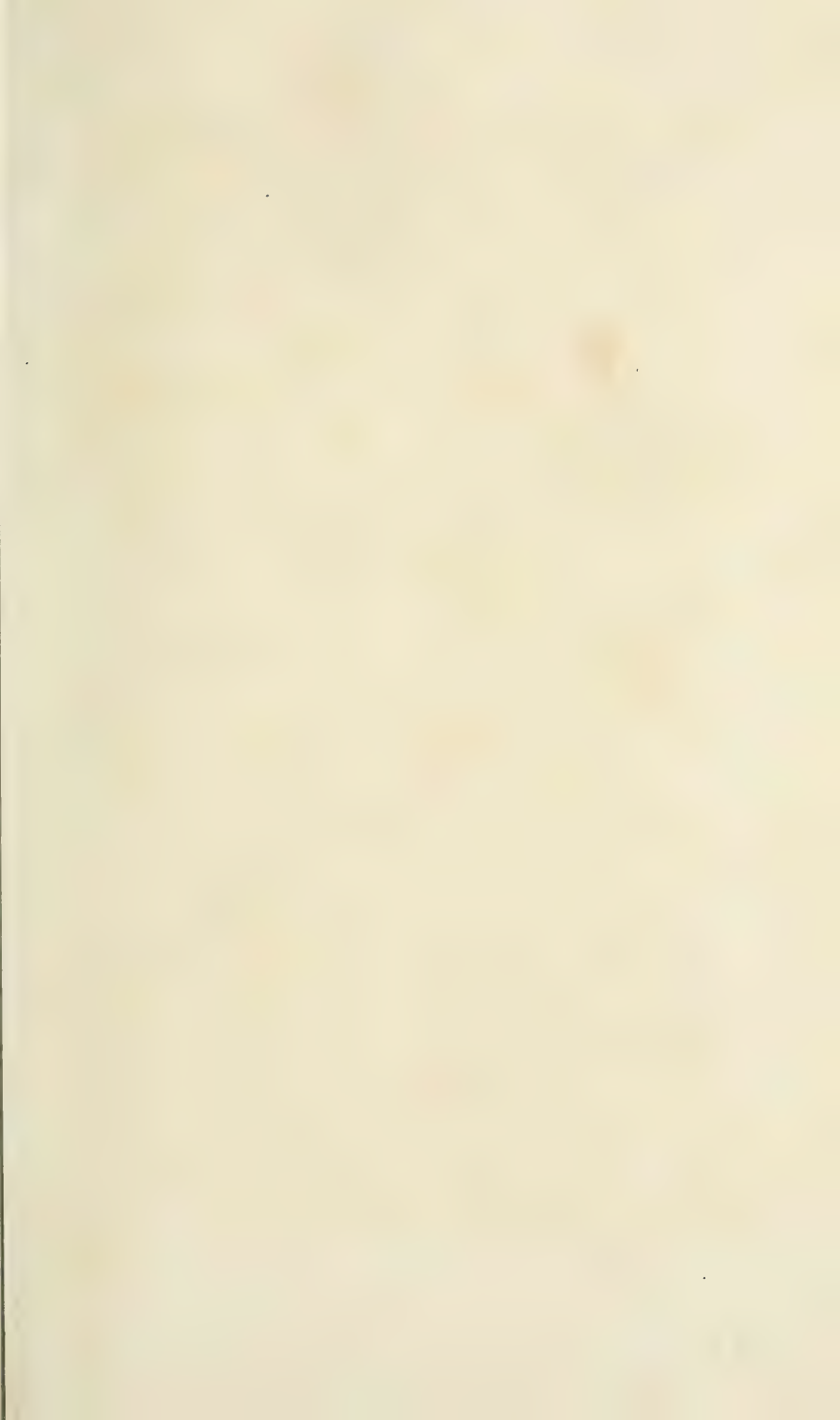
Tillage, very early in Scotland,
 page 61.
 —, where first practised, 61.
 —, circumstances affecting,
 123.
 —, proper depth of, 126.
 Tithes, 77, 78—80.
 Tobacco, 189.
 Trees, 233.
 —, kinds proper for particular
 soils, 234.
 Trenching, 278.
 Turnips, culture of, 180, 181, 182.
 —, when and by whom first
 sown in Perthshire, 181.
 —, preservation of from the
 fly, 182.
 —, preservation of in winter,
 183.
 —, Swedish, 184.
 —, proper spring food for
 sheep, 185.

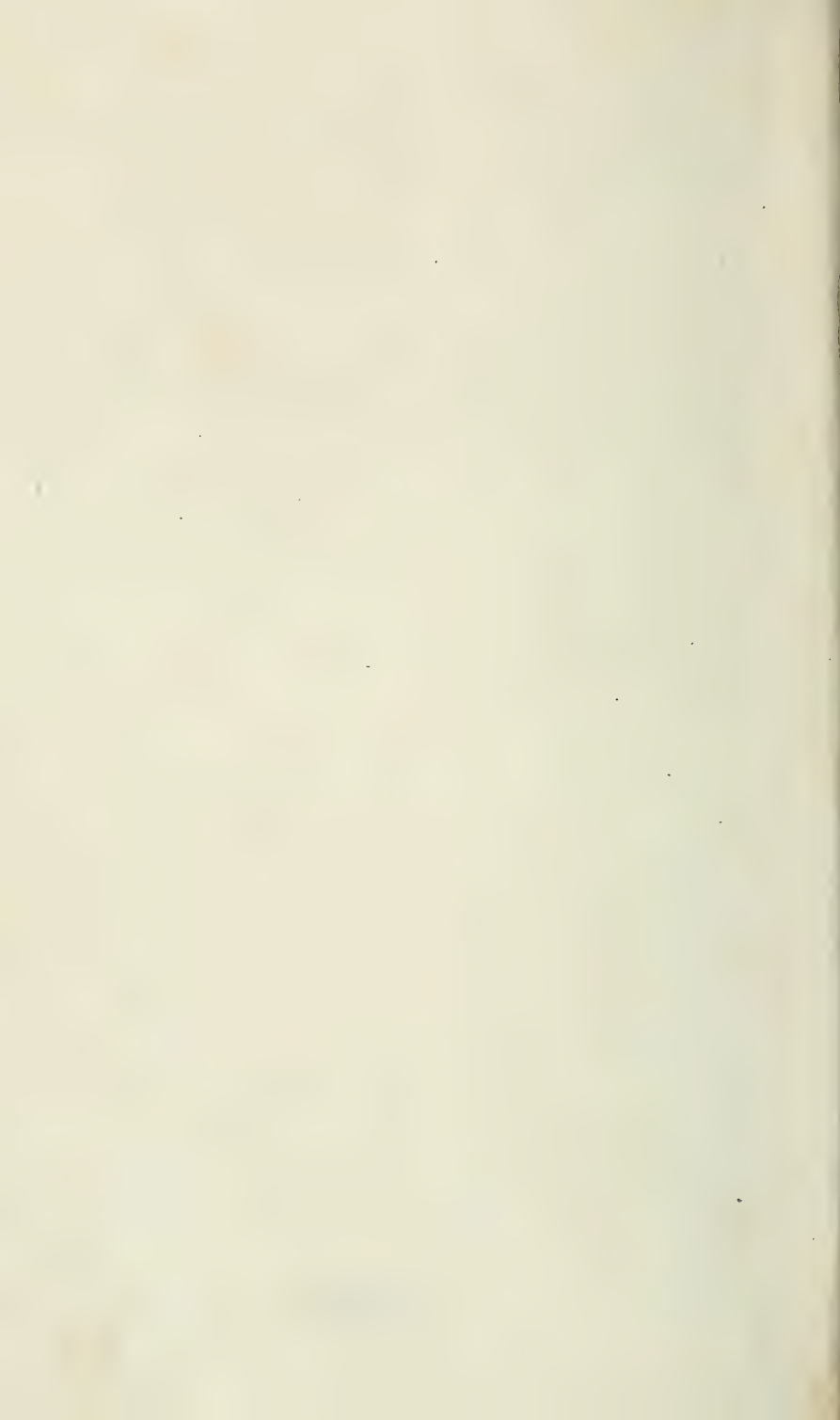
V

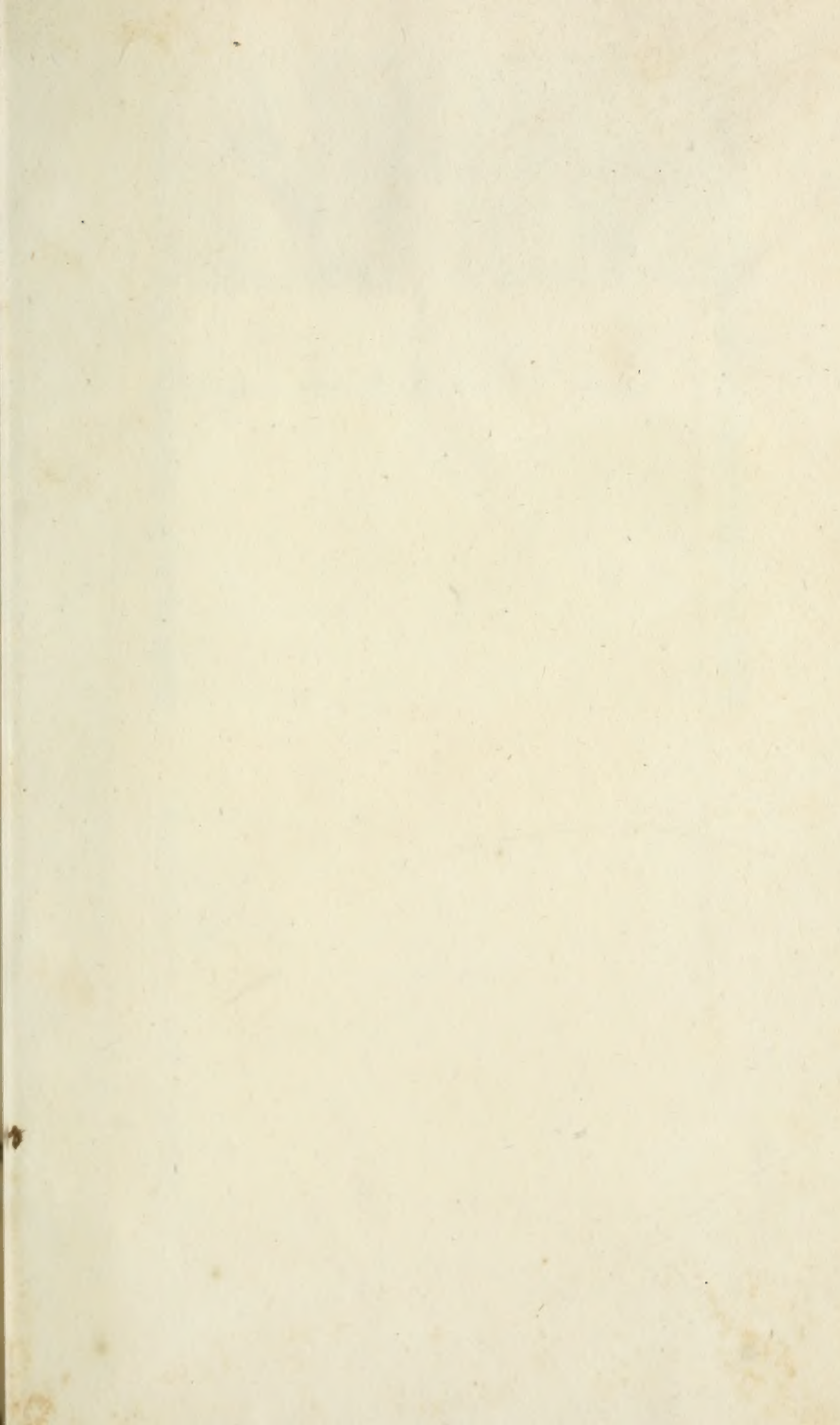
Vermin, eagles, and foxes, how
 may be extirpated, 410, 411.
 Villages, first establishment of, 57.
 —, conveniences to be stu-
 died in setting down, 55.
 —, causes of increase and en-
 largement, 58.
 —, utility to the public, 59.

W

Warmth of a country, how may
 be increased, 117, 118.
 Waftes, 244—246, 265.
 —, how to be reclaimed, 266.
 Water of county of Perth, 27.
 —, mineral of do. 28, 29.
 Watering or irrigation, 299—302.
 Weeding of corns, 299.
 Weights, table of, 6.
 —, uniformity recommend-
 ed, 405—407.
 —, ought to be used in sell-
 ing all commodities not liquid,
 408.
 Wheat, culture of, 143—145.
 Woods and plantations, 230, 231.
 —, kinds of, 232.
 —, natural fir, where, 235.
 —, oak, management of, 236.
 —, how to restore old stools,
 238.







University of British Columbia Library

DATE DUE

JAN 7 A.M.

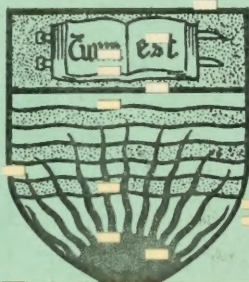
AUG 15 1980

FEB 16 1964 RECD

RD#OF#AGRICULTURE\$#GENERAL#VIEW#OF#THE

STORAGE

AGRICULTURE FORESTRY LIBRARY



FORESTRY
AGRICULTURE
LIBRARY

